Clatronic

CTV 502/CTV503

Service Manual

Chassis 14.1

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SAFETY INSTRUCTIONS

SAFETY - PRECAUTIONS
WARNING: The following precautions should be observed.

1. Although the chassis is isolated from the mains supply, some areas of the main PCB are at mains potential. An isolation transformer (250-500 VA) should therefore be connected between the mains and the receiver before service is attempted.

2. Do not install, remove, or handle the picture tube in any manner unless safety goggles are worn. People not equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.

3. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place, such as: barriers, non-metallic knobs, cable ties, adjustments and compartment cover or shields, isolation resistor-capacitor, etc.

4. When service is required note the original lead locations and anchor points. Ensure all leads, especially in areas of high voltage, are routed/anchored in their correct locations when reassembling the receiver.

5. Always use the manufacturer's replacement safety. component. Always replace original spacers and maintain lead lengths. Critical safety components should not be replaced by other makes. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.

6. Before returning a serviced receiver to the customer, the service technician must throughly test the unit to be certain that it is completely safe to operate without danger of electric shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing. Therefore, the following checks are recommended for the continued protection of customers and service technicians.

INSULATION
Insulation resistance should not be less than 10M at 500V DC between the mains poles and any accessible metal parts.
Also, no flashover or breakdown should occur during the dielectric strength test applying 3kV AC or 4.25kV DC for two seconds between the mains poles and accessible metal parts.

HIGH VOLTAGE
High voltage should always be kept at rated value of the chassis and not higher. Operating at higher voltage may cause a failure of the picture tube or high voltage supply and also, under certain circumstances could produce x-ray radiation moderately in excess of design levels. The high voltage must not, under any circumstances exceed 26kV on the chassis.

X-RAY RADIATION
TUBES. The primary source of x-ray radiation in this receiver is the picture tube. The tube utilised for the above mentioned function in this chassis is specially constructed to limit x–ray radiation. For continued x-ray radiation protection, replace tube with the same type as the original approved type.

PRODUCT SAFETY NOTICE
Many electrical and mechanical parts in television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a ⚠ on the schematics and replacement parts list in this Service Manual.
The use of substitute replacement components which do not have the same safety characteristics as the manufacturer recommended parts, may create electrical shock, fire, Xray-radiation, or other hazards.

TUBE DISCHARGE
The line output stage can develop voltages in excess of 25kV; if removal of the EHT cap is required then, discharge the anode cap to chassis via a high value resistor, prior to its removal from the tube.

TECHNICAL SPECIFICATIONS 14.1 CHASSIS

1. OPERATING CONDITIONS

POWER SUPPLY	140 TO 265 VAC
NOMINAL OPERATING VOLTAGE	230 VAC
TEMPERATURE RANGE	0 TO 45 DEGREES C
HUMIDITY RANGE	YEAR'S MEAN = 75% MAX=95%

2. RF SECTION

2.1 RECEIVING CHANNELS FOR VHF/UHF BAND

	CCIR B/G	UK I	FRANCE L	OIRT D/K
VHF BAND				
BAND I	CH 2-4	CH 2-4	CHL 1-5	CH 2-4 CH 1-5
BAND III	CH 5-12	CH 6-12	CH 5-12	CH6-12
CABLE	S1-S19,S20-S41	S1-S19,S20-S41	S1-S16, S21-S41	S1-S19-S22-S341
UHF BAND				
BAND IV-V	CH 21-69	CH 21-69	CH 21-69	CH 21-69

		MIN	NOM	MAX	UNIT
GAIN LIMITED SENSITIVITY	:				
INPUT SIGNAL LEVEL FOR STANDARD VIDEO OUTPUT VOLTAGE					
BAND 1/3		—	20	—	dBµV
BAND 4/5		—	23	—	dBµV
NOISE LIMITED SENSITIVITY					
INPUT SIGNAL LEVEL FOR 30 dB (S+N)-RATIO, WEIGHTED, CCIR REC 567					
BAND 1/3/4/5	:	—	40	—	dB(µV)
SELECTIVITY HF + IF					
IF FREQUENCIES	:				

	B/G	I	L	L'	D/M
Picture Carrier	38.9	38.,9	38,9	32.7	38,9
Sound Carrier	33.4	32,9	32,4	39.2	32,4
Colour Carrier	34,47	34,47	34.47	37.13	34.47

		MIN	NOM	MAX	UNIT
VOLTAGE STANDING WAVE RATIO	:				
BAND 1/3	:	—	2	4	—
BAND 4/5	:	—	2	4	—
MAXIMUM INPUT SIGNAL LEVEL	:				
BAND 1/3	: 100 dB µV (MAX)				
BAND 4/	: 100 dB µV (MAX)				

1. OPERATING CONDITIONS

		MIN	NOM	MAX	UNIT
Video Output Voltage (measured on cathode with lowest output level, contrast control and drive control at max	:	90	100	—	V
Frequency Response					
a) Input Aerial Standart, HF signal (STANDARD B/G - D/K-I-L)	:	–10	–7	—	dB
b) Input: Scart PIN 20 (STANDART B/G - D/K-I-L)	:	–8	-6		dB

4. chroma section

PAL/SECAM PAL/SECAM CAPTURE RANGE	:	+-300	+-400	- HZ
PHASE ERROR OF REFERENCE CARRIER	:	-	+-5	10 DEGRESS
COLOUR KILLER	:			

5. SOUND SECTION

	MIN	NOM	MAX	UNIT
SCART OUTPUT S/N RATIO	40	45	-	dB

NOISE LIMITED SESSITIVITY		:	38 db/V (NOMINAL)
AM SUPRESSION RATIO		:	60 db (NOMINAL)
POWER OUTPUT (at 10% distortion) fm= 1KHz	20"/21"	:	2x7 Watts Rms
	25"/28"	:	2x10 Watts Rms
	29"/33"	:	2x12 Watts Rms

6. SYNCHRONISATION

LINE FREQUENCY LOCKING RANGE	:	± 300 HZ
VERTICAL FREQUENCY LOCKING RANGE	:	± 5HZ

7. PICTURE TUBE DRIVE SECTION

EHT	:	25.0 ± 0.5 KV (20"-21") 28.5 ± 0.5 KV (25"-28") 29.0 ± 0.5 KV (29")
FOCUS VOLTAGE	:	MIN 25.6% MAX 38%
GRID 2 VOLTAGE RANGE	:	MIN 300 V, MAX 1350 V
HEATER VOLTAGE	:	6.2±0.2 Vms

Power Supply Voltages

B+SUPPLY VOLTAGE (AT ib=0)	33"	:	159V ± 1V
	29"	:	125V ± 1V
	28"	:	145V ± 1V
	25"	:	145V ±1V
	21"	:	116 V ± 1V
	20"	:	119 V ± 1V
28V OUTPUT		:	28 ± 0.5 VDC
15V OUTPUT		:	15 ± 0.5 VDC
12V OUTPUT		:	12 ± 0.5 VDC
8V OUTPUT		:	8.0 ± 0.5 VDC
5V OUTPUT		:	5.0 ± 0.5 VDC
3,3V OUTPUT		:	3.3 ± 0.5 VDC

8. OTHERS

AMBIENT OPERATING TEMPERATURE		:	0-45 DEGREES C
STORAGE TEMPERATURE		:	-10 TO + 85 DEGREES C
POWER CONSUMPTION		:	
STAND-BY		:	2 Watts
Operation	20"21" Models	:	110 Watts (max)
	25"/28" Models	:	145 Watts (max)
	33" Models	:	170 Watts (max)
	29" Models	:	160 Watts (max)
SAFETY		:	IEC 65 /BS P2N
X-RAY RADIATION		:	ACC. IEC 65 /BS P2N
Picture Tube Dimensions/Visible Screen Size		:	
		:	20" (51 cm/48 cm)
		:	21" (55 cm/51 cm)
		:	25" (63 cm/59 cm)
		:	28" (70 cm/66 cm)
		:	29" (72 cm/68 cm)
		:	33" (84 cm/80 cm)

1. SECTION: INSTALLATION AND PRECAUTIONS

• *Position the television so that direct light does not fall on the screen. Excessive light will cause a washed out effect.*

• *Do not place the television near heat sources such as radiators, ovens, stoves, etc. Do not use the television near any apparatus that produces a magnetic field such as HI-FI speakers or electric motors otherwise colour purity may be affected.*

• *The heat built up in the set escapes through ventilation holes, so do not cover the set by drapes, clothes etc. that may block air circulation. Do not place the television on carpet or soft furnishings.*

• *Do not place a vase or flower pot on the television top.*

• *Clean the TV Screen using a slightly damp cloth or chamois leather. Never use abrasive cleaning agents, and always remove the mains plug from the socket outlet while cleaning.*

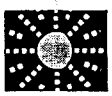
• *If you wish to place the television on a shelf or in a wall unit always ensure there is a minimum air gap of 8 cm around the top, sides and rear of the television, to assist ventilation.*

• *Your TV set is designed to operate with mains voltages 230V AC; 50Hz.*
Do not connect your TV set to power sources other than the mains supply.

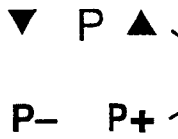
2. Technical Features:

CONTROL UNIT:

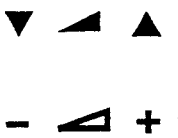
Power ON/OFF switch



Stand-by indicator



Programme Down/Up button

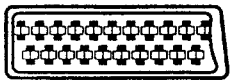


Volume decrease/increase button

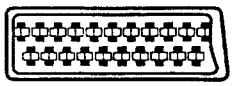
Headphone socket
(Dependant on model)

Sockets

Aerial Input



Scart socket (AV-1)

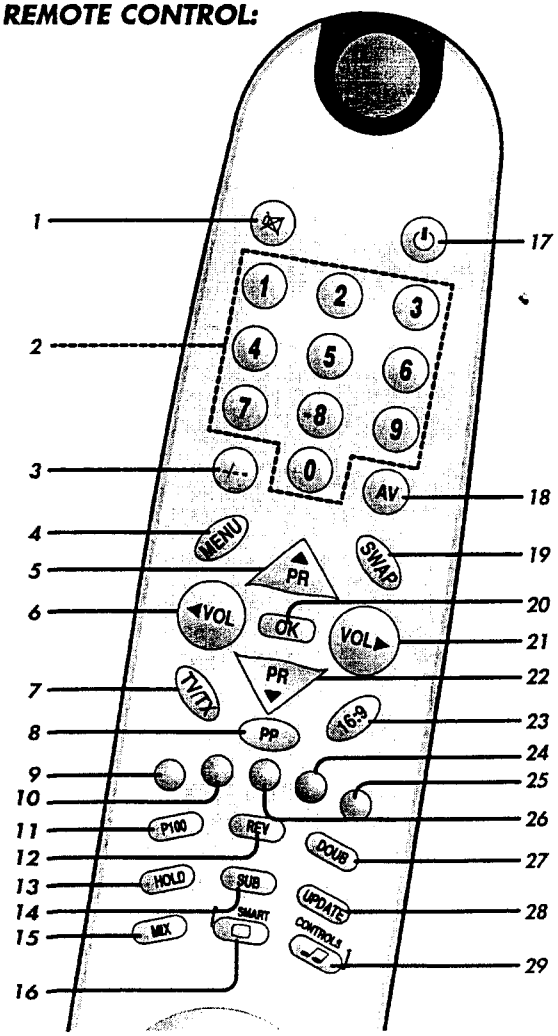


Scart socket (AV-2),
(Dependant on model)

External connections table

	20"	21"	25"	28"	33"
AV - 1	Standard	Standard	Standard	Standard	Standard
AV - 2	Model Dependant	Model Dependant	Model Dependant	Standard	Standard
Headphone	Not available	Not available	Standard	Model Dependant	Standard

REMOTE CONTROL:



1. MUTE button
2. Ten Key Programme button
3. Two digit programme button (-/--)
4. Menu button
5. Programme Up button
6. Volume decrease button
7. Teletext selection button
8. PP
9. Red Fastext button (Sound menu selection)
10. Green Fastext button (Picture menu selection)
11. P100/Index button
12. Reveal button (REV)
13. Hold button
14. Clock / Sub-page button
15. Mix button
16. Picture adjustment selection button (Smart Control)
17. STAND BY button
18. AV button
19. SWAP button
20. OK button
21. Volume increase button
22. Program down button
23. 16:9 picture format button
24. Blue Fastext button (Setup menu selection)
25. Purple button (Features menu selection)
26. Yellow Fastext button (Programme Edit menu selection)
27. Enlarge button (DOUBLE)
28. Update button
29. Equalizer selection button (Smart Control)

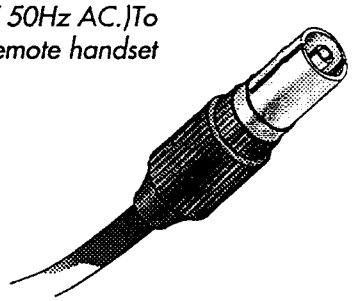
SPECIAL FEATURES :

- *Your TV can receive stereo channels directly.*
- *Automatic channel selection*
- *100 Programme Memory*
- *Available for Cable Channels (A decoder maybe required)*
- *Manual Fine Tuning*
- *Child Lock*
- *Return to the last channel viewed (SWAP)*
- *Space Sound effect*
- *16:9 picture format*
- *Normalisation system to recall the setting in memory after the colour, contrast, brightness setting have been changed.*
- *Picture adjustment using one button*
- *Smart Control*
- *Equalizer Sound Setup*
- *Automatic Volume Limiting*
- *Your TV set is equipped with an On-Screen Display system. This system enables the user to see the function on-screen and to control them efficiently.*
- *Infrared Remote Control*
- *Your TV will automatically switch off if it's been programmed from 5 to 120 minutes, and it will automatically switch to Stand by five minutes after a channel ceases to transmit.*
- *Demonstration mode*
- *Menu with 8 languages*
- *Stereo headphone (optional)*
- *Scart Socket video cassette recorder, satellite receiver, video disc player,TV games or a home computer can be connected to this AV socket with an appropriate connecting cable.*

3. PREPARATIONS

MAINS SUPPLY CONNECTIONS

Connect the TV mains plug into your domestic mains socket outlet (230V 50Hz AC.)To switch on press the TV on/off switch then any numbered button on the remote handset or P+/P- button on the control panel.

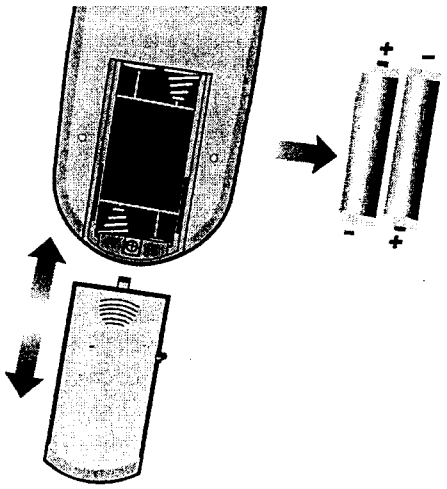


AERIAL CONNECTION

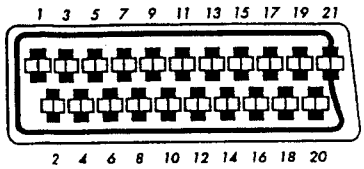
Using a 75Ω aerial lead connect your TV to the aerial outlet in your home.

BATTERY FITTING

Remove the slide cover by pulling down from the lines. Install the two AAA size batteries observing the correct polarity and refit the cover.

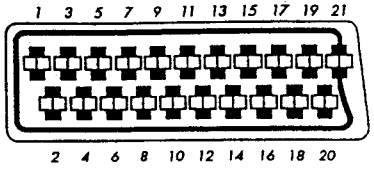


Pin Connections For Scart Socket 1



1- *Audio output Right*
2- *Audio input Right*
3- *Audio output Left (Mono)*
4- *Audio ground*
5- *Blue ground*
6- *Audio input Left (Mono)*
7- *RGB input, Blue*
8- *Switching voltage*
9- *Green ground*
10-
11- *RGB input, Green*
12-
13- *Red ground*
14- *Ground*
15- *RGB input, Red*
16- *Blanking Signal*
17- *Video output ground*
18- *Video input ground*
19- *Video output*
20- *Video input*
21- *Screening*

Pin Connections For Scart Socket 2 (model Dependant)

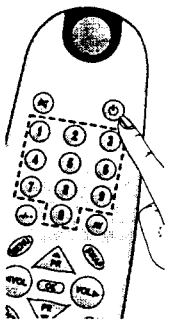


1- *Audio output Right*
2- *Audio input Right*
3- *Audio output Left (Mono)*
4- *Audio ground*
5- *Blue ground*
6- *Audio input Left (Mono)*
7-
8- *Switching voltage*
9- *Green ground*
10-
11-
12-
13- *Red ground*
14- *Ground*
15-
16-
17- *Video output ground*
18- *Video input ground*
19- *Video output*
20- *Video input*
21- *Screening*

Note 1 : *You can record the broadcast from the equipment connected to the scart socket 1 to the equipment connected to the scart socket 2 by selecting AV 1 mode. But you can not watch the normal TV broadcast.*

4. OPERATING YOUR TV

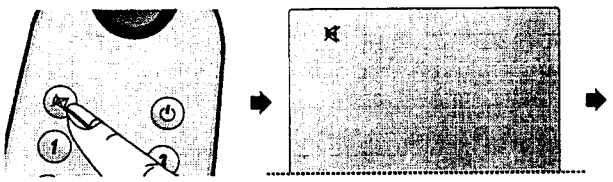
STANDBY



By pushing the red ***STANDBY*** *button on the upper right hand side of your remote control, the television will switch into standby. To turn your TV on again you can press any of the programme buttons on the remote control.*

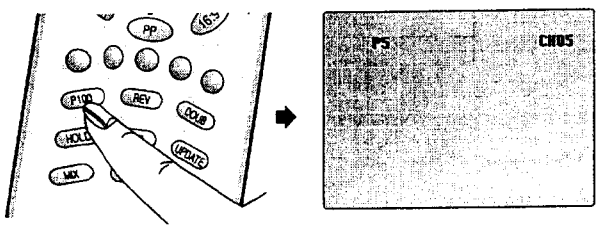
ATTENTION!
Always switch the television off by the TV ON/OFF switch when leaving the TV unattended.

MUTE



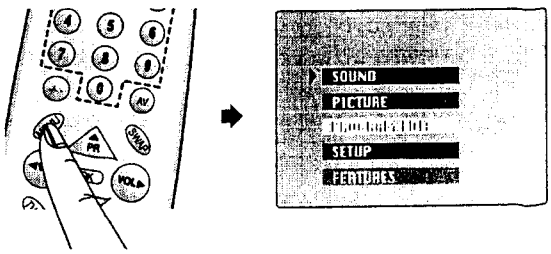
If you want to mute the sound of your TV press the " 🔇 " button. A red symbol " 🔇 " will appear on the screen. Pressing the " 🔇 " again will restore the sound.
When your TV is in MUTE mode if you press the ***◄VOL*** *button the volume will decrease without restoring the sound.*
But if you press the ***VOL►*** *button the sound will be restored and the volume will increase.*

INFO BUTTON



By pressing the ***"P100"*** *button the programme number and programme name will appear on the screen.*
This will disappear automatically after a few seconds.

MAIN MENU

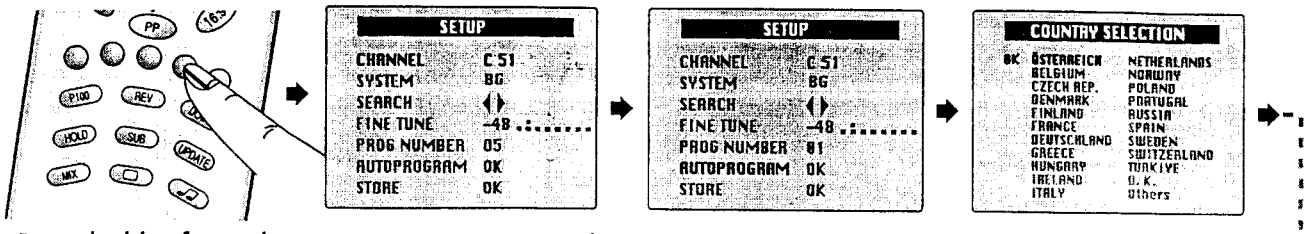


Press menu button the Main Menu will appear. You can select any sub-menu using ***PR▲/PR▼*** *buttons and then pressing "OK" button.*

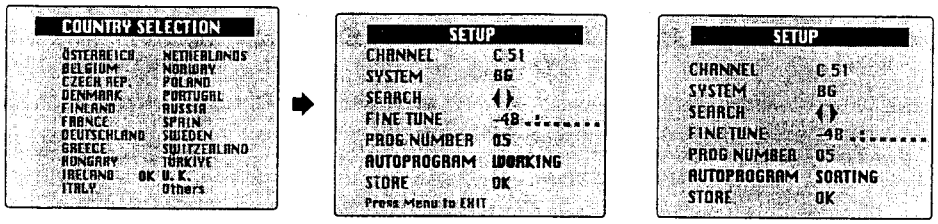
TUNING and MEMORY

You can tune the TV either automatically or manually.

Automatic tuning and memory :



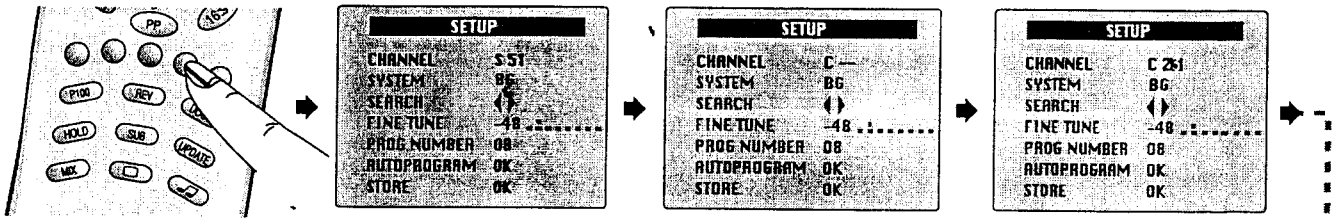
- *Press the blue fastext button on your remote control.*
- *Setup menu will appear on the screen.*
- *Select Autoprogramme using **PR▼** button.*
- *Press OK. The Country Selection menu will now appear on the screen.*



- *Select the desired Country using the **PR▲/PR►** or **◄VOL/VOL►** buttons.*
- *Press OK. Your TV will start to search for and store programmes. Meanwhile AUTOPROGRAM WORKING sign will flash on and off on the AUTOPROGRAM row. Once AUTOPROGRAM is completed the TV will automatically arrange the programmes into order.*
- *To stop this process press Menu button. Your TV will sort all stored programmes. During this period AUTOPROGRAM SORTING will appear in SETUP mode.*

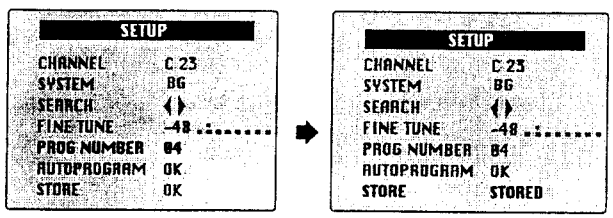
Note: If auto sort fails to arrange the programmes in the required sequence please refer to programme edit on page 13.

Manual tuning and memory:



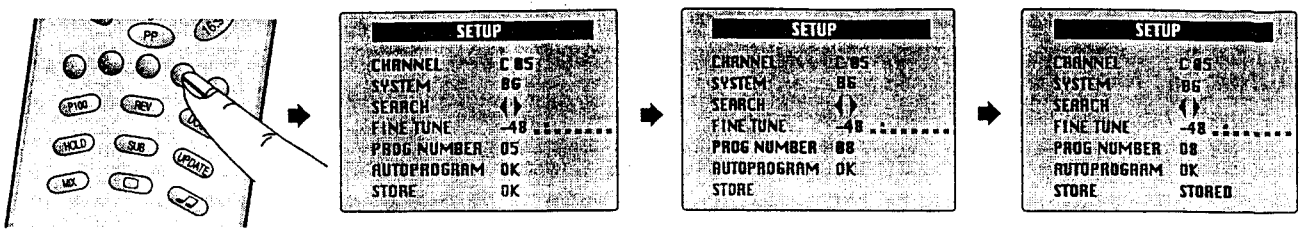
Tuning with known channel numbers:

- *Press the blue fastext button on your remote control.*
- *SETUP menu will appear on the screen.*
- *Press OK button then using **PR▲/PR▼** and **◄VOL/VOL►** buttons select S for cable channels and C for terrestrial broadcast.*



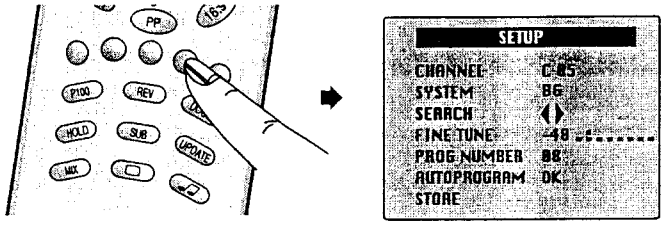
- *Press **VOL►** button to select the channel row then enter the channel number using the numeric keys on the remote control.*
- *Press OK, then select PROG NUMBER using the **PR▼** button. Enter the programme number for the channel you have tuned to (ie 01 for BBC1) using the numeric keys on the remote control.*
- *Select STORE using **PR▼** button then press OK to store.*

Tuning with unknown channel numbers:



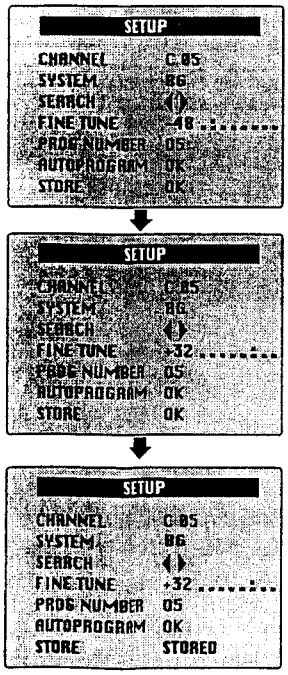
- *Press blue button to enter SETUP menu.*
- *Scan channel numbers using ◄**VOL/VOL**► buttons.*
- *If the required station is found select PROG NUMBER using **PR▼** button.*
- *Enter the desired programme number using numeric key pad or ◄**VOL/VOL**► buttons.*
- *Select STORE using the **PR▼** button then press OK to store.*

Tuning with SEARCH option :



- *Press blue button to enter SETUP menu.*
- *Select SEARCH using **PR▼** button and start tuning using ◄**VOL/VOL**► buttons.*
- *The TV will tune until a TV station is found.*
- *If you want to store this station select PROG NUMBER using the **PR▼** button. Enter the desired programme number then select STORE using the **PR▼** button. Press OK to store*

Manual Fine Tune:



It may now be necessary to fine tune your TV to optimise reception if so proceed as follows

- *In the SETUP menu select FINE TUNE using **PR▼** button.*
- *Use the ◄**VOL/VOL**► buttons to obtain the best optimum setting.*
- *Select STORE using the **PR▼** button. Then press OK to store.*

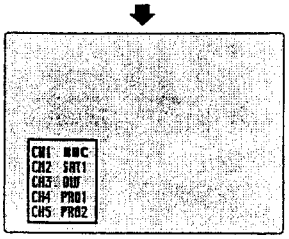
Programme Recall:

***1.** You can recall any programme by pressing the **PR▲/PR▼** buttons or numeric key pad. When the desired programme has two digits first press -/-- button and then two digits of the programme.*

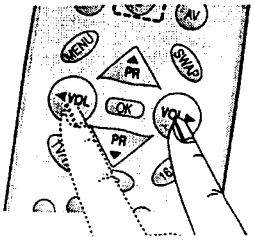
***2.** By pressing SWAP button on your remote control you can select the last viewed channel.*

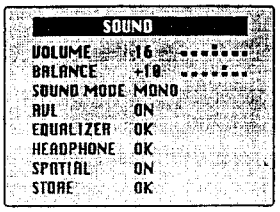
***3.** Pressing OK button on your remote control a small programme menu will appear on the screen.*

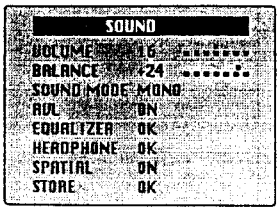
*You can also select the desired programme from this menu. In this menu hidden programmes will be coloured red and the programmes including Child Lock will be blue coloured. Using **PR▲/PR▼** buttons select the desired programme then press OK to watch that channel. This menu will disappear automatically. You can also use TV/TX button to exit the menu.*

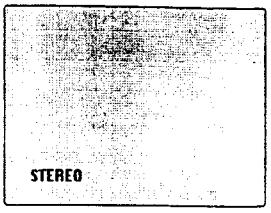


SOUND PRESETS









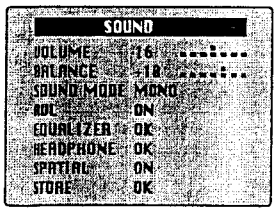
• *By pressing the ◄**VOL** and **VOL**► buttons on your remote or by using the volume + and volume - on the front panel you can change the volume level of your TV.*
• *Press red button on your remote control to enter the SOUND menu.*

• *You can perform other sound adjustments with this menu. Select BALANCE using the **PR**▼ button. Then use ◄**VOL** and **VOL**► buttons to adjust the volume levels of the left and right speakers individually.*

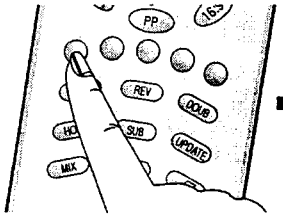
• *If the channel is stereo STEREO will appear on the screen.*
• *Select SOUND MODE using **PR**▼ then press ◄**VOL** or **VOL**► buttons for DUAL I or DUAL II selection.*

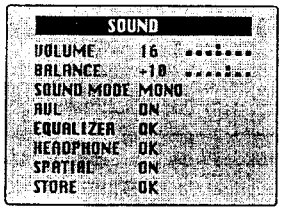
AVL (Automatic Volume Limiting) :

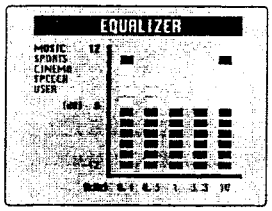
• *In the SOUND menu, select AVL by using **PR**▼ button. TV transmitters have different sound modulation. When switching from one programme to another some annoying sound level differences can be noticed.*
• *To avoid this, select ON by pressing ◄**VOL** or **VOL**► button.*



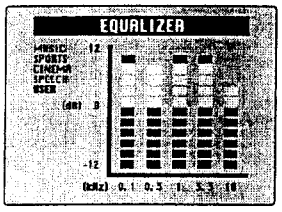
EQUALIZER:

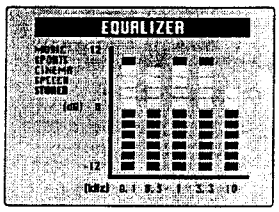


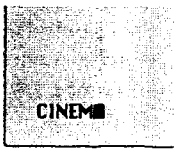




• *Press the RED button on your remote control.*
• *SOUND menu will appear on the screen.*
• *Select EQUALIZER using the **PR**▼ then press OK button.*
• *Equalizer adjustment menu will appear on the screen.*
• *By pressing **PR**▲/**PR**▼ buttons, you can select any adjustment according to the broadcast. Adjustments for the Music, Sports, Cinema and Speech can not be changed. But in the USER mode you can select the desired adjustments yourself.*

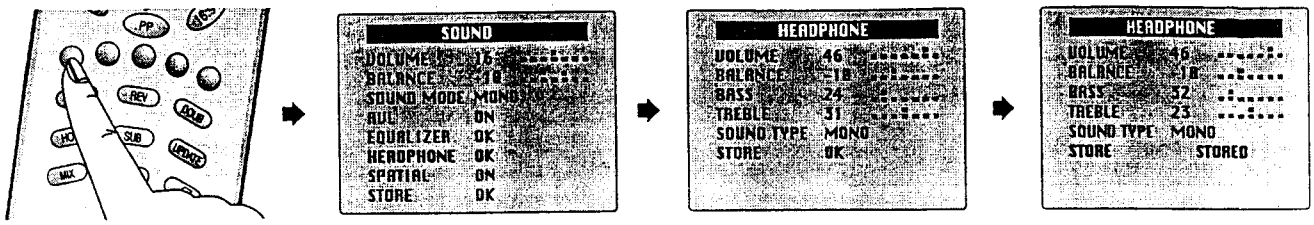






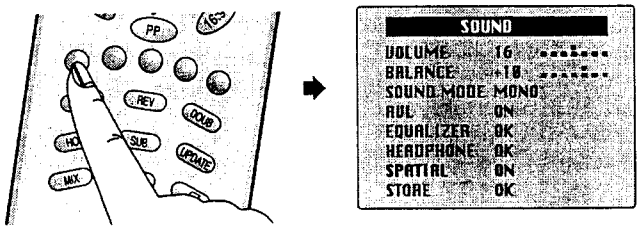
• *To do this, select USER using the **PR**▼ button then press OK.*
• *Adjust the sound to the desired level by pressing ◄**VOL** or **VOL**► and **PR**▲/**PR**▼ buttons.*
• *To store these settings select STORE using the **PR**▼ button, then press OK.*
• *To exit the menu press RED button.*
***NOTE:** You can also select Equalizer positions by pressing ♫ button on the remote control.*
• *When you press this button, Equalizer modes will appear on the lower left side of the screen subsequently one by one.*

HEADPHONE (Dependant on model) :



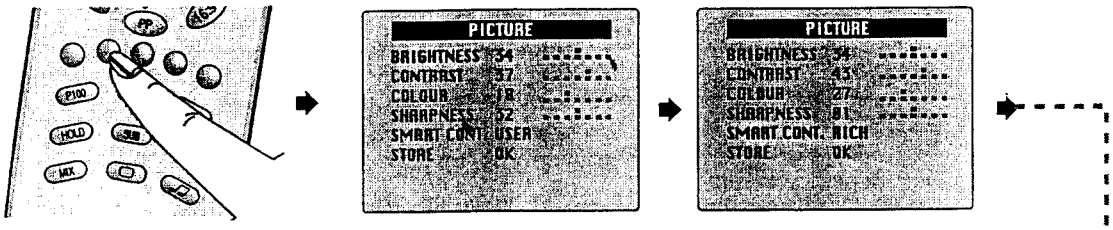
- *Press red button on the remote control.*
- *SOUND menu will appear on the screen.*
- *Select HEADPHONE using* ***PR▼*** *button.*
- *Then press OK.*
- *Headphone menu will appear on the screen. If you insert a suitable headphone to the headphone socket of your TV you can use these features.*
- *Select any adjustment using* ***PR▲/PR▼*** *buttons then adjust to the desired level using* ***◄VOL*** *and* ***VOL►*** *buttons.*
- *To store these settings select STORE using the* ***PR▼*** *button, then press OK.*

SPATIAL:

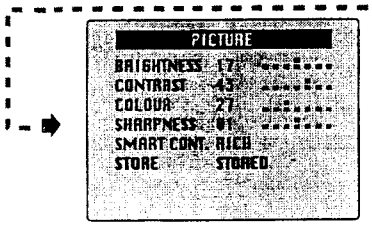


- *If you want to give a spatial effect to the sound, press RED button on the remote control.*
- *SOUND menu will appear on the screen.*
- *Select SPATIAL using the* ***PR▼*** *button then select ON using the* ***◄VOL/VOL►*** *buttons.*
- *To store these settings select STORE using the* ***PR▼*** *button, then press OK.*
- *If you want to exit SOUND menu you can press TV/TX button.*

PICTURE ADJUSTMENTS:



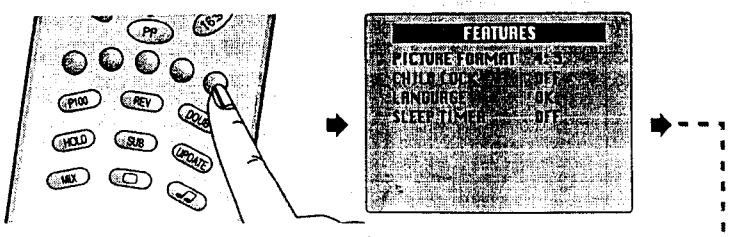
- *Press green button on the remote control.*
- *PICTURE menu will appear on the screen.*
- *Using* ***PR▲/PR▼*** *for adjustment selection and* ***◄VOL/VOL►*** *buttons for desired levels you can make the adjustments. While doing this USER will appear in the SMART CONT row. These are the personal presets. There are also special adjustments called SOFT, NATURAL and RICH. These adjustments can not be changed by the user.*
- *To select one of these select SMART CONT. using* ***PR▲/PR▼*** *then press* ***◄VOL /VOL►*** *buttons.*



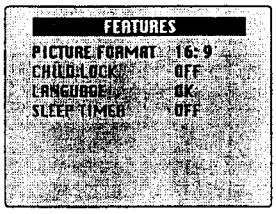
- *In order to store the changes select STORE using the* ***PR▼*** *button. Then press OK button on your remote control.*

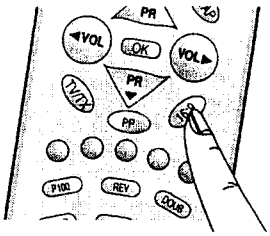
NOTE: *You can also select the picture control alternatives using "▭" button on your remote control without entering the picture menu.*

OTHER FEATURES:



- *Press the purple button on your remote control.*
- *FEATURES menu will appear on the screen.*





PICTURE FORMAT:

The picture format of your TV set is 4:3. If you want to change picture format from 4:3 to 16:9;

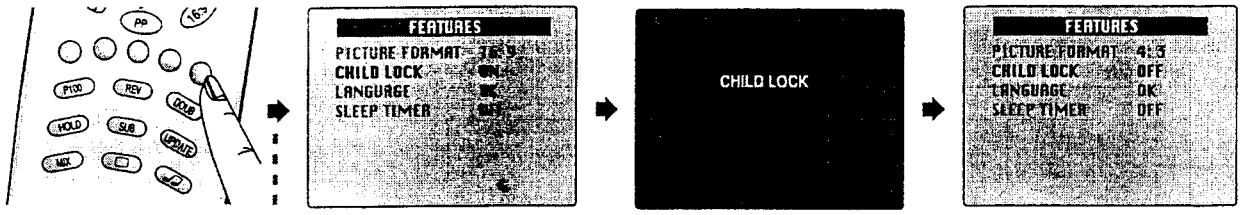
- *Select PICTURE FORMAT using* **PR▼** *button then press* **◄VOL/VOL►** *buttons.*

NOTE: *Also you can use the Picture Format (16:9) button on your remote control to change the format from 4:3 to 16:9 directly.*

- *"16:9" sign will appear on the lower left side of the screen for a short while.*

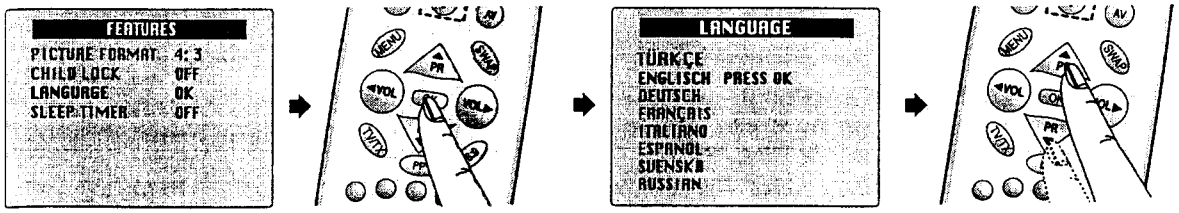
CHILD LOCK:

You can lock any channel using this feature.



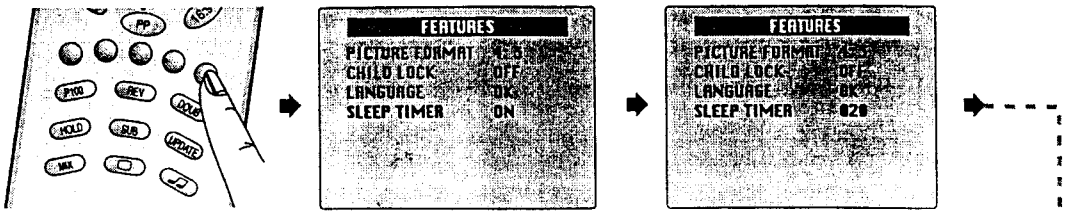
- *Select the channel that you want to lock then press purple button.*
- *Then select CHILD LOCK using* **PR▼** *button.*
- *Using* **◄VOL/VOL►** *buttons select ON.*
- *Press TV/TX to exit. Child Lock will appear on the screen. When you change the channel then select this channel again you will see this message on the screen again.*
- *To cancel Child Lock enter FEATURES menu.*
- *Select CHILD LOCK using* **PR▼** *button.*
- *Then Select OFF using* **◄VOL/VOL►** *buttons.*

MENU LANGUAGE:



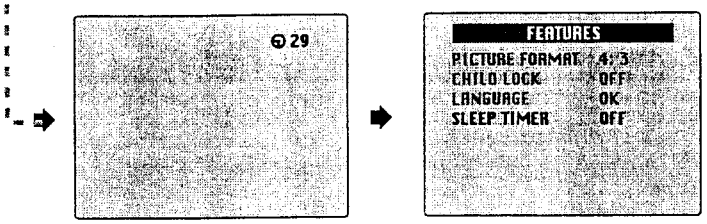
- *Press the purple button on your remote control. FEATURES menu will appear on the screen.*
- *Press* **PR▼** *button to select LANGUAGE then press OK.*
- *LANGUAGE menu will appear on the screen. Press the* **PR▲/PR▼** *buttons to select your desired language.*
- *Press OK button. All the on screen displays will appear in the selected language.*
- *Press the TV/TX button to return to normal TV viewing.*

SLEEP TIMER :



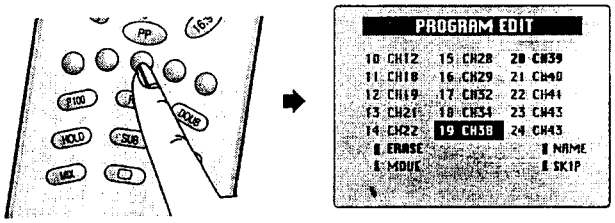
The sleep timer automatically switches the set to stand-by after the preset time has elapsed.
You can select the time from 5 to 120 minutes with 5 minutes steps.

- *Press the purple button.*
- *FEATURES menu will appear on the screen.*



- *Select SLEEP TIMER using **PR▼** button.*
- *Select the desired time using **◄VOL/VOL►** buttons.*
- *Press TV/TX button to exit.*
- *To view the remaining sleep time, press the purple button.*
- *To cancel the sleep time select OFF in SLEEP TIMER.*

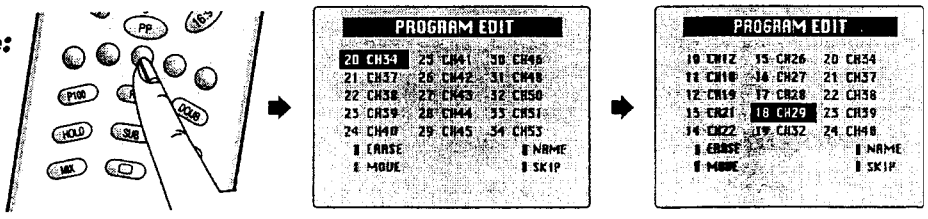
PROGRAMME EDIT



Deleting a programme:

- *Press YELLOW button on your remote control.*
- *PROGRAM EDIT menu will appear on the screen.*
- *Select a programme to be deleted with the **PR▲/PR▼** or **◄VOL/VOL►** buttons.*
- *Press the PURPLE button on the remote control.*
- *The selected programme is deleted, all the following programmes are shifted up one position.*

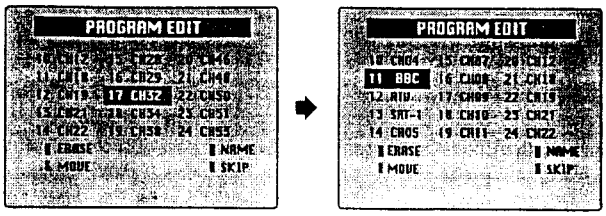
Moving a programme:



- *Press the YELLOW button on the remote control.*
- *PROGRAM EDIT menu will appear on the screen.*
- *Select a programme to be moved with the **PR▲/PR▼** or **◄VOL/VOL►** buttons.*
- *Press the GREEN button on the remote control. The selected programme number and name turn to green.*
- *Select the programme number that you want to move to by using the **PR▲/PR▼** or **◄VOL/VOL►** buttons.*

Then press the GREEN button. The programme has now been stored in the new location.
NOTE: All programmes following will be shifted down by one place.

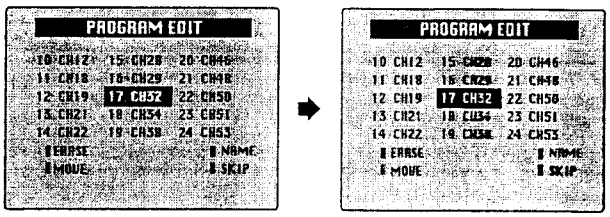
Naming a programme:



- *Enter PROGRAM EDIT menu as described before.*
- *Select the programme to be named with the* ***PR▲/PR▼*** *or* ***◄VOL/VOL►*** *buttons.*
- *Press the blue button on the remote control. The program number and name digits turn to blue.*
- *To change the letters use the* ***PR▲/PR▼*** *buttons.*
- *To select the next character use* ***VOL►*** *button.*
- *After entering all characters press blue button to store.*

Skipping a stored programme:

When a programme number is skipped it means that you will be unable to select it using the ***PR▲/PR▼*** *button during normal TV viewing.*



- *Enter PROGRAM EDIT menu as described before.*
- *Select the programme to be skipped with the* ***PR▲/PR▼*** *or* ***◄VOL/VOL►*** *buttons.*
- *Press the red button. The skipped programme turns to red.*
- *If you want to select the skipped programme, directly enter the programme number using the NUMBER buttons.*
- *If you want to cancel this function, enter PROGRAM EDIT menu and select the skipped programme and press the red button.*

TELETEXT

Teletext is an information and news service available on several programme channels. It enables you to get up to the minute information on such diverse subjects as international events, holidays, shopping or even the local weather for your area.

The signal for teletext is combined with the transmitted signal which provides you with your programmes. To get best results for both, we would recommend that an out door aerial is used. Poor reception will cause errors in the text displayed on the screen, ie words missing from sentences or letters missing from words. Even with good reception some errors can occur, however, these should correct themselves within a few seconds. Such errors or word corruptions usually indicate a reception fault rather than a fault with your television. If the channel has no Teletext "NO TEXT" sign will appear on the screen and will disappear automatically after 5 seconds.

Using the TELETEXT function

Press the TV/TX button on the handset. This will change the picture mode to TELETEXT. Ensure that the channel you are on broadcast Teletext. When the TV/TX button is pressed it will revert back to picture mode.

Page Selection

Enter the three digit page number of your choice using the programme key buttons. The selected page number will appear in the top left of the header page. If you want to select the next or the previous page use the ***PR▲*** *or* ***PR▼*** *buttons.*

P100 (Index / Info button)

Press this button to select the Index page.

MIX

With Teletext displayed press this button once to mix the text and picture information, press again to return to full teletext page. While you are using the ***"MIX"*** *function, you can return to the TV mode only by pressing the* ***"TV/TX"*** *button.*

UPDATE

While the TV is searching the selected page press this button once to enter update mode. This allows you to clear the text and return to a TV programme. When the page is located the TV will display the page number it is searching for. When the page is located press the UPDATE button again to return to the page you required.

Whenever an updated newsflash is available, the updated news item will appear over the normal TV programme. Press the UPDATE button twice to make the news information disappear.

To return the normal TV picture press the TV/TX button.

SUB (Sub page button)
Some text pages have extension or sub-pages containing additional information. You can press SUB button to select the sub-pages; on the first line "S*****" will be displayed.
These can be viewed by keying in the four digit number using the numeric keypad. Press the SUB button to return to the main-page.

Clock function
A real time clock is transmitted constantly whilst the channel is being broadcast which can be displayed. You can press the SUB button to see the real time while watching the TV channel.

DOUB (Enlarge button)
This will expand the top and bottom of the page to double height when repeatly pressed. If you press the DOUB button for the third time you can retum to normal page size.

REV (Reveal button)
Sometimes a teletext page contains concealed information, for example, in a quiz or puzzle. To Display the concealed information press this button.

HOLD (Stop button)
This button allows you to "HOLD" certain pages of Teletext information if a teletext page consists of 2 or more sub pages and shows them in a cycle. Press again to cancel "HOLD" and to proceed to the next page.

Fastext
Colour coded buttons are emplayed for FASTEXT. When teletext is selected several subject titles will appear at the bottom in coloured forms. By pressing one of the four colour coded buttons you will go directly to that particular page without having to select the page using the numeric pad.

Toptext (Optional)
This mode includes menu followed index pages to select the teletext pages easier. You can use two different ways to use this mode:
a- Press the INDEX button (P100) and enter the toptext index page.
b- With the coloured subject titles or with the page numbers of them, which appear at the bottom of each teletext pages.

On the MENU title of a toptext index page appear the subject titles. Press the RED or BLUE button to select a particular subject title. Press the GREEN button to select this page. You can select the next and previous pages by pressing the RED and GREEN button.

The YELLOW title includes the next sub-title and the BLUE title includes the next main-title pages. By pressing one of these colour coded buttons you will go directly to that particular page without having to select the page using the numeric pad.

You can also select directly the teletext pages by using the numeric pad on the TOPTEXT mode.

PIN VOLTAGES OF IC'S

IC 101 (TDA 8844)					
Pin No.	Connections	DC (V)	Pin No.	Connections	DC (V)
1	SIF-AGC	0	29	(B-Y) output	2,1-2,3
2	Ext. Audio input	0	30	(R-Y) output	2,2-2,3
3	GND	0,2	31	(B-Y) input	2,1-2,3
4	GND	0	32	(R-Y) input	2,2-2,3
5	PLL-IF filter	2,5-3,7	33	NC	0,3
6	IF video output	2,4-38	34	Crystal 3.58 Mhz	2,5
7	SCL	2,5	35	Crystal 4.43 Mhz	2,5
8	SDA	1,7-2	36	phase dedektör	4,3-4,8
9	Decopling Bandgap	6,7	37	VCC Suppy	8
10	SVHS - Chroma input	1,1	38	CVBS output	2-3,2
11	SVHS - Y input	3,4	39	Digital supply decoupling	5
12	VCC Supply	8V	40	H - DRIVE output	1,1
13	Dahili CVBS input	3,6-4	41	Sand-Castle out-Hor.Fly input	0,6
14	GND	0	42	Phase 1 dedector	2,8
15	Audio output	3,1	43	phase 2 dedector	4
16	Secam PLL decoupling	0,5-1	44	GND	0
17	Ext. CVBS input	3,4	45	East/West Drive signal	3-3,2
18	I - BLANK input	3-5	46	V-DRIVE B output	2,2
19	B (Blue) output	2-3,2	47	V-DRIVE A output	2,2
20	G (Green) output	2-3,2	48	IF-1 input	4,6
21	R (Red) output	2-3,2	49	IF-2 input	4,6
22	Beam-Current input	3,5	50	EHT protection	2-2,2
23	R (Red) input	3,5	51	Vertical sawtooth	3,7-4
24	G (Green) input	3,5	52	V-I REF	3,8
25	B (Blue) input	3,5	53	AGC decoupling	3,8-4,2
26	F - BLANK input	0,2-0,6	54	Tüner AGC output	4,3
27	Y - Lüminance input	2,1-3	55	GND	0
28	Y - Lüminance output	2,1-3	56	Sound demodulator decoupling	3,2-3,5

IC 701 (TDA 6107)		
Pin No.	Connection	DC (V)
1	Red - IN	2,3-2,5V
2	Green - IN	2,5-2,7
3	Blue - IN	2,5-2,7
4	GND	0
5	BLACK	4,5-5,5
6	VDD Supply	190
7	Red - OUT	134-137
8	Green - OUT	128-130
9	Blue - OUT	130-137

IC 301- MULTI STANDARD SOUND PROCESSOR (MSP 3400D)					
Pin No.	Connections	DC (V)	Pin No.	Connections	DC (V)
1			33	Scart 2 (R) output	3,7
2	GND	0	34	Scart 2 (L) output	3,7
3	GND	0	35	GND	0
4	GND	0	36	Scart 1 (R) output	3,7
5	GND	0	37	Scart 1 (L) output	3,7
6	GND	0	38	Volume	6,5-7
7	NC + B Supply	4,9	39	Analog Supply	8
8	NC + B Supply	4,8	40	Volume	6,2-7,2
9	SCL	2,4-2,6	41	GND	0
10	SDA	1,8-2,1	42	Analog ref. Supply	3,6
11	NC	2,4	43	Scart 4 (L) input	3,6
12	NC	2,4	44	Scart 4 (R) input	3,6
13	NC	2,4	45	GND	0
14	NC	0,4-2,1	46	CINC H - (L) input	3,6
15	NC	0,4-2,1	47	CINCH - (R) input	3,6
16		0,5-2,1	48	GND	0
17		0,5-2,1	49	Scart 2 (L) input	3,6
18	+ B Supply	4,9	50	Scart 2 (R) input	3,6
19	GND	0	51	GND	0
20	NC		52	Scart 1 (R) input	3,6
21	GND	0	53	Scart 1 (L) input	3,6
22	GND	0	54	A/D converter ref. voltage	2,5
23	GND	0	55	Mono sound input	3,6
24	MSP, RESET	5 V	56	GND	0
25	Earphone (R) out	0-2	57	Analog supply	4,9
26	Earphone (L) out	0-2	58	IF input	1,5
27	GND	0	59	-	1,5
28	R-OUT	0,1-2,1	60	IF input 2	0,1
29	L-OUT	0,1-2,1	61	GND	0
30	Dolby (C) on	0,1-2,1	62	Crystal oss. input	2,2
31	Dolby (C) on	0,1-2	63	Crystal oss. input	2,1
32	Dolby (S) on	0,1-2	64	GND	0

IC 601 - MC 44608AP			
Pin No.	Connections	DC (V)	
		STBY	ON
1	Demag	0,005	0,85
2	Isense	0,32	0,07
3	Control input	5,5	5
4	GND	—	—
5	Driver	0,14	2,1
6	VCC	8,8	12,3
7	NC	—	—
8	VI	117	116

(IC 401) SAA 5563							
Pin No.	Connections	DC (V)		Pin No.	Connections	DC (V)	
		STBY	ON			STBY	ON
1	NC	1,7	1,9	27	GND	0	0
2	Muting NC	1,6	2	28	GND	0	0
3	NC	1,7	2	29	COR-OSD	1,2	2,1
4	NC	1,7	2	30	NC	1,3	2,1
5	NC	1,7	2	31	VDDA Supply	3,2	3,1
6	Program+	3,2	3,2	32	B-OSD output	0	0,9
7	Program-	3,2	3,2	33	G-OSD output	0	0,9
8	Volüme +/-	3,2	3,2	34	R-OSD output	0	0,9
9	NC	1,7	1,9	35	F-BLANK OSD	0	0,1
10	NC	1,7	1,9	36	H-SYNC input	0,3	0,4
11	Status 1	0	0	37	V-SYNC input	0	0,4
12	Status 2	0	0	38	GND	0	0
13	GND	0	0	39	VDC Supply	3,2	3,2
14		1,5	1,8	40	X-TAL GND	0	0
15	SVHS switching	1,5	1,9	41	Crystal OSS. input	2,7	011
16		1,6	1,8	42	Crystal OSS. output	1,6	1,6
17	L/L'	1,6	1,9	43	RESET	0,5	011
18	MSP-Reset	0	4,9	44	VDDM Supply	3,2	3,2
19	Stand-by led	0	1,8	45	NC	1,3	0,7
20	ON / OFF	4,1	0	46	NC	1,3	0,7
21	VCC	3,2	3,2	47	"IR" input	3,1	3,1
22	GND	0	0	48		1,7	1,7
23	CVBS - TXT input	0,7	1,1	49	SCLO in/out	3,3	3,3
24	CVBS 1	0,1	0,1	50	SDAO in/out	0,1	0,1
25	SYNC filter input	0,2	0,7	51	SCL1 in/out	0	2,4
26	I REF input	1,2	1,2	52	SDA in/out	0	1,9

AUDIO OUTPUT IC					
Ayak No.	Connections	DC (V)	Pin No	Connections	DC (V)
1	Left - IN	1,6	7		0,5-0,9
2	Left - IN V	1,6	8	Right - OUT	14,2
3	MUTE	15,3	9	VS	28
4	Right - IN V	1,6	10	Left - OUT	13,9
5	Right - IN	1,6	11		0,5-0,9
6	GND	0	12	Left - IN	0,6

1- PH 601 (PC 127 FY) PHOTOCOUPLER

Pin Number	Stand-by (Volt)	ON (Volt)
1	12,5	11
2	11,5	10
3	5,5	5
4	8,8	12,3

2- T 603 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 603	0,6	0,02	0	0,1	0,3	0

3- T 604 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 604	0,02	12,7	0	0,7	0,05	0

4- T 605 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 605	0,6	0,02	0	0,1	0,7	0

5- T 606 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 606	0,6	0	0	0,1	6,8	0

6- T 607 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 607	0,6	0	0	0,1	2,5	0

7- T 307 (BC 848) NPN

Number	TV Stand-by (Volt)			TV ON (Volt)		
	B	C	E	B	C	E
T 606	0,6	0	0	0,1	15,3	0

8- T401 (BC 848) NPN

B	C	E	Mode
1,6	2,1	0,9	No Picture
0,5	2,4	0,9	Picture
1,5	2,3	0,9	Test OSD

9- T402 (BC 848) NPN

B	C	E	Mode
1,6	2,1	0,9	No Picture
0,5	2,4	0,9	Picture
1,5	2,3	0,9	Test OSD

10- T403 (BC 848) NPN

B	C	E	Mode
8,1	0	8,1	Picture
8	0,4	8	TEXT
8,1	0,5	8	OSD

11- T404 (BC 848) NPN

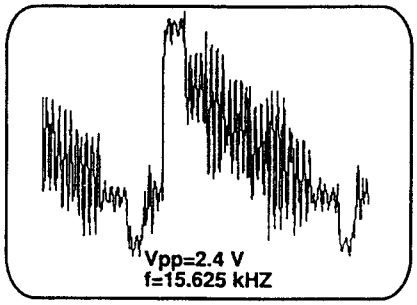
B	C	E	Mode
1,6	2,1	0,9	No Picture
0,5	2,4	0,9	Picture
1,5	2,3	0,9	Test OSD

12- T405 (BC 848) NPN

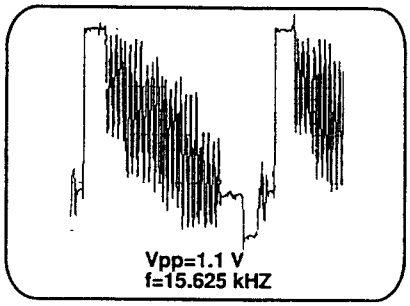
B	C	E	Mode
0,2	8	0	Picture
2,8	7,5	2,3	TEXT
0,4	8	0,2	OSD

OSCILLOGRAMS

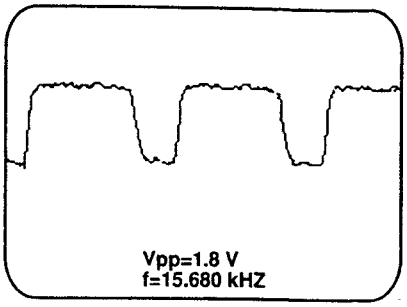
1- IC 101 (TDA 8844)



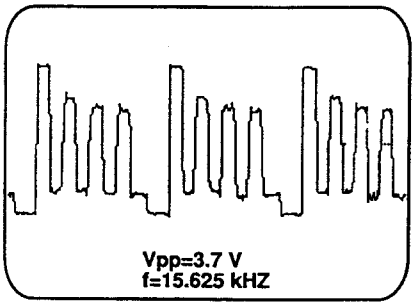
Pin 6



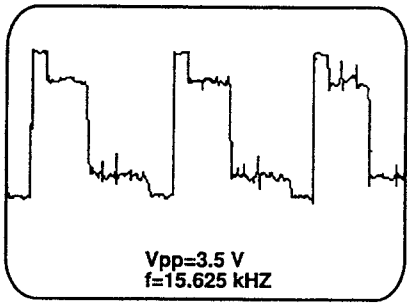
Pin 13



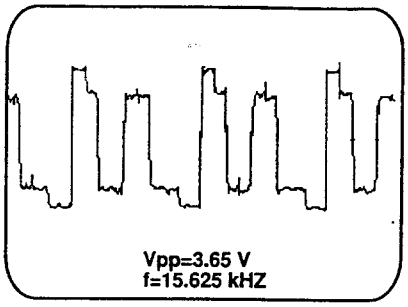
Pin 18



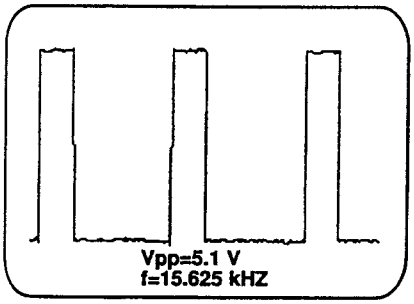
Pin 19



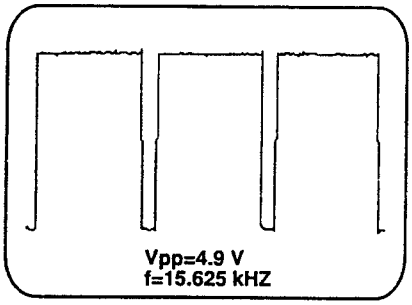
Pin 20



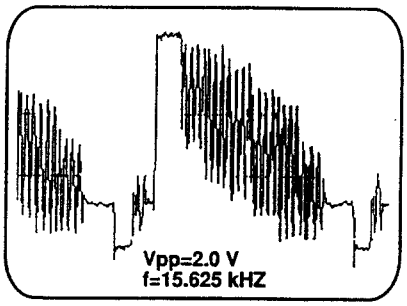
Pin 21



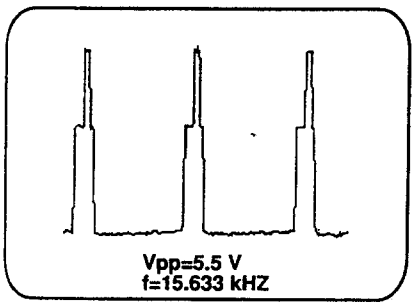
Pin 26 (OSD ON)



Pin 26 (TXT ON)

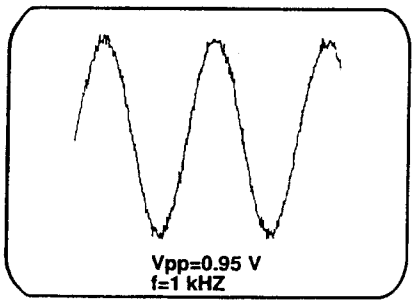


Pin 38

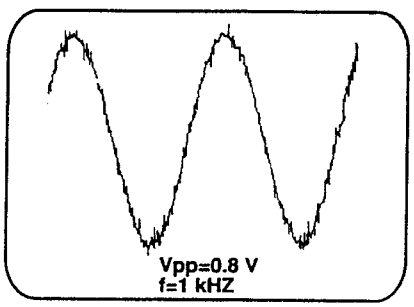


Pin 41

2- IC 301 (MSP 3400D)

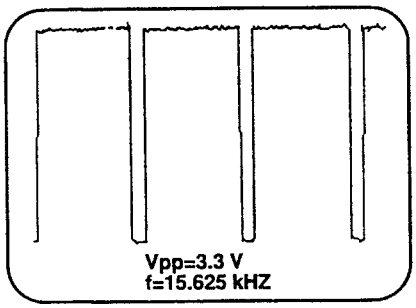


Pin 28

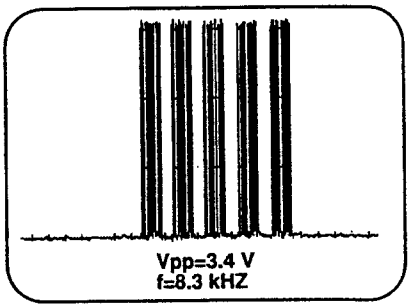


Pin 29

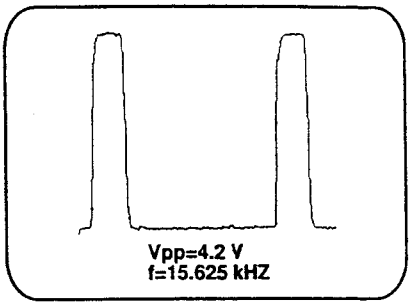
3- IC 401 (SAA 5563)



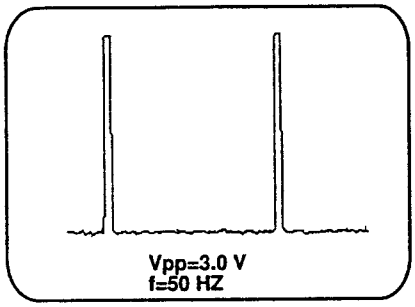
Pin 35 (TXT ON)



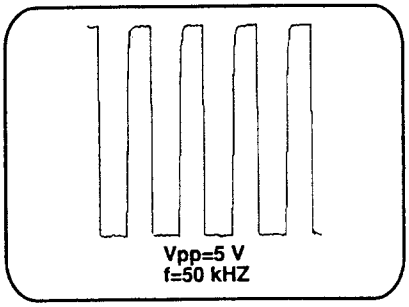
Pin 35 (OSD ON)



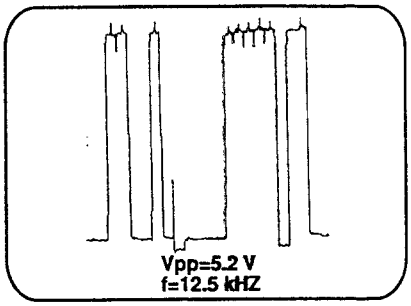
Pin 36



Pin 37

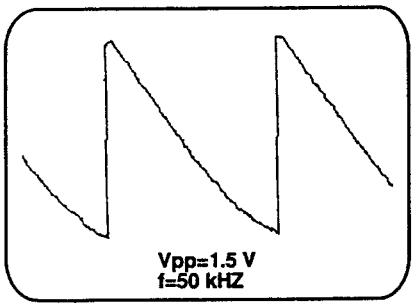


Pin 51

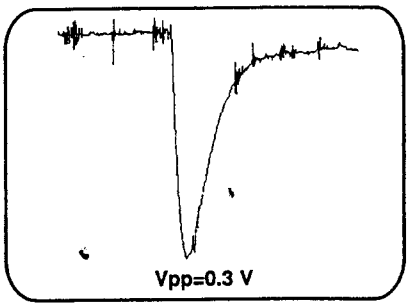


Pin 52

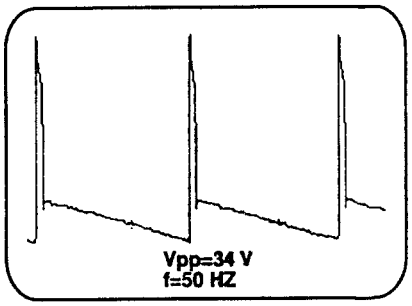
4- IC 501 (TDA 8351)



Pin 1

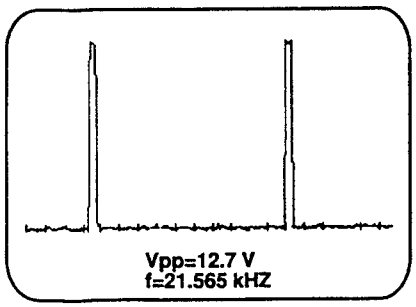


Pin 2

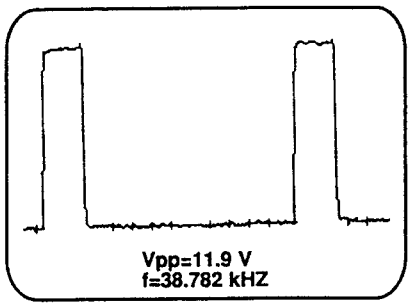


Pin 7

5- IC 601 (MC 44608 AP)

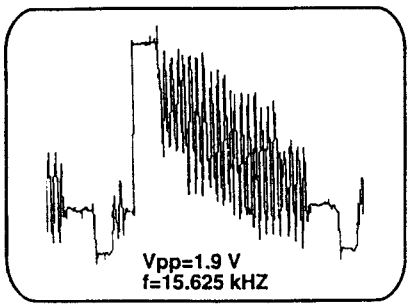


Pin 5 (Stand-By)

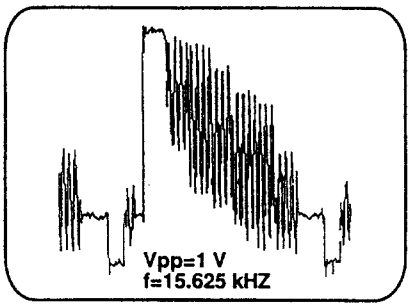


Pin 5 (TV ON)

6- T103 (BC 848 NPN)

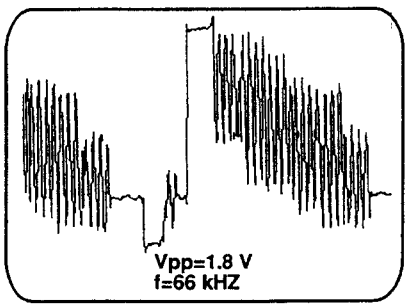


Emitter (Scart 2 CVBS OUT)



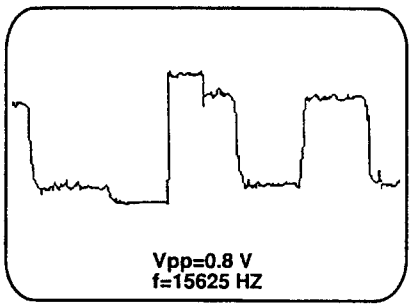
Emitter (CVBS TXT)

7- T106 (BC 848 NPN)



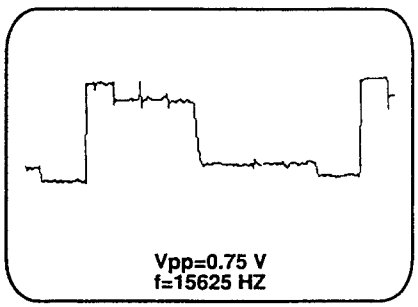
Emitter (Scart 1 CVBS OUT)

8- T401 (BC 848 NPN)



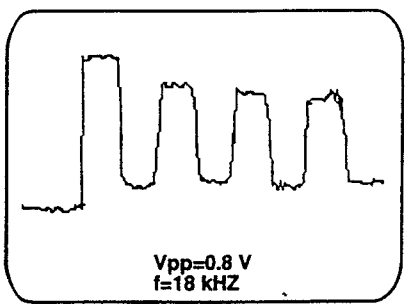
Collektör (R-OSD)

9- T402 (BC 848 NPN)



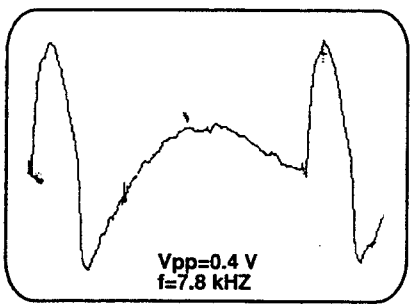
Kollektör (G-OSD)

10- T404 (BC 848 NPN)

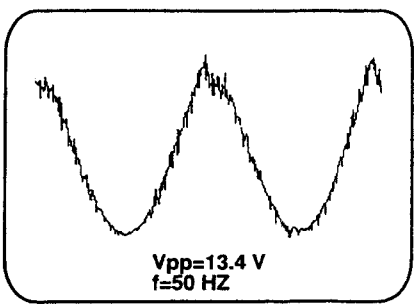


Collektör (B-OSD)

11- T501 (2SK 2381)

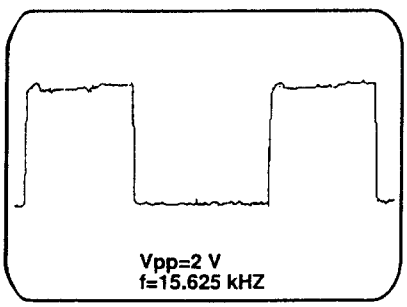


Gate (EW Drive)

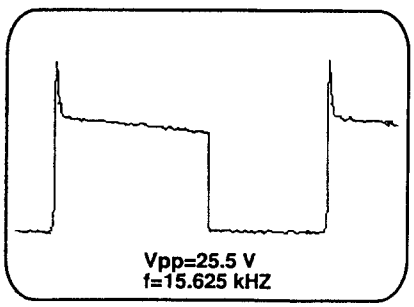


Drain

12- T503 (BC 618)

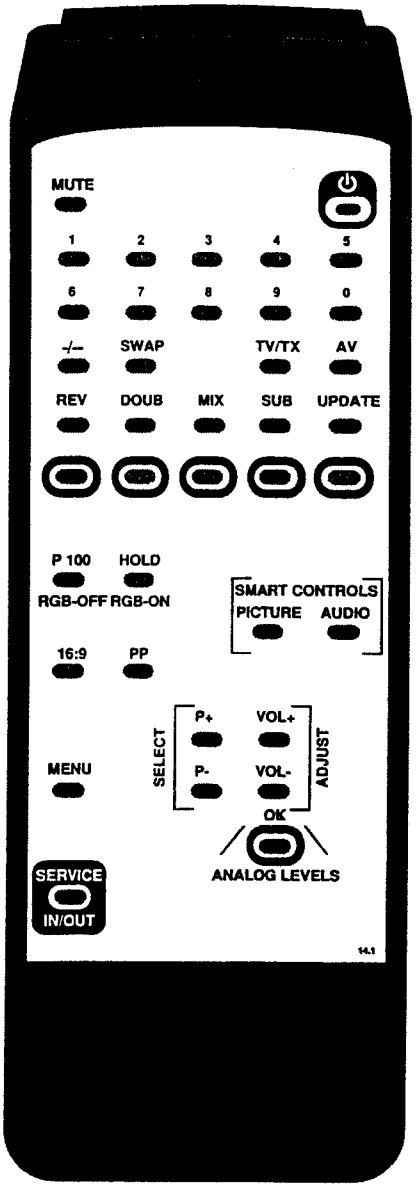


Baz (H-DRIVE)



Collektör

Service Remote Control



TROUBLE SHOOTING GUIDE

1. Power Supply Defects

2. Picture and Colour Defects

3. Deflection Defects
   a) Horizontal Deflection Circuit Defects
   b) Vertical Deflection Circuit Defects

4. Micro Controller Defects
   a) OSD Defects
   b) TXT Defects

5. Audio Circuit Defects

SERVICE ADJUSTMENTS

1- Supply Voltage Adjustment

Adjust + B Voltage, measured at the cathode of the diode D 611 while screen potentiometer is set to the minimum. Select AV Mode.

For	33"	to	159V + 1V
For	29"	to	125V + 1V
For	28"	to	145V + 1V
For	25"	to	145V + 1V
For	21"	to	120V + 1V
For	20"	to	120V + 1V

2- Service Mode Adjustments

Enter Service Mode using Service Remote Control. Apply an antenna signal with 65dB(V± 1dB(V (1.8 mV) level to the set.

2.1 AGC Adjustment

Select AGC by using +P, -P buttons.
Adjust the amplitude of the 38,9MHz Signal at IF 2 pin of tuner to 220mVpp±20mVpp

2.2 Adjust STD. It should be STD-BY OFF
Adjust EEPE. It should be 00.

2.3 Adjust PEAK to 08
Adjust HEAD to ON for 28",
to OFF for 21"

3- Geometry Adjustment

Select FUBK or Philips test pattern

3.1	Adjust	VZOM	to	20
	Adjust	VSCR	to	1F
	Adjust	AV	to	03
	Adjust	CRT	to	4:3

3.2 Select VSLP by using P+/P- buttons.
At this mode lower half of the screen is black.
Adjust VSLP to the center line of the test pattern.
Adjust VSHT to the center line of the test pattern.

3.3 Adjust vertical linearity at SCOR and
Adjust Vertical amplitude at VAMP.

Adjust horizontal amplitude at	EWW and
Adjust horizontal position (phase) at	HSHT.
Adjust general parabol adjustment at	EWPW.
Adjust corner parabol adjustment at	EWCR.
Adjust trapez distortion at	EWT.

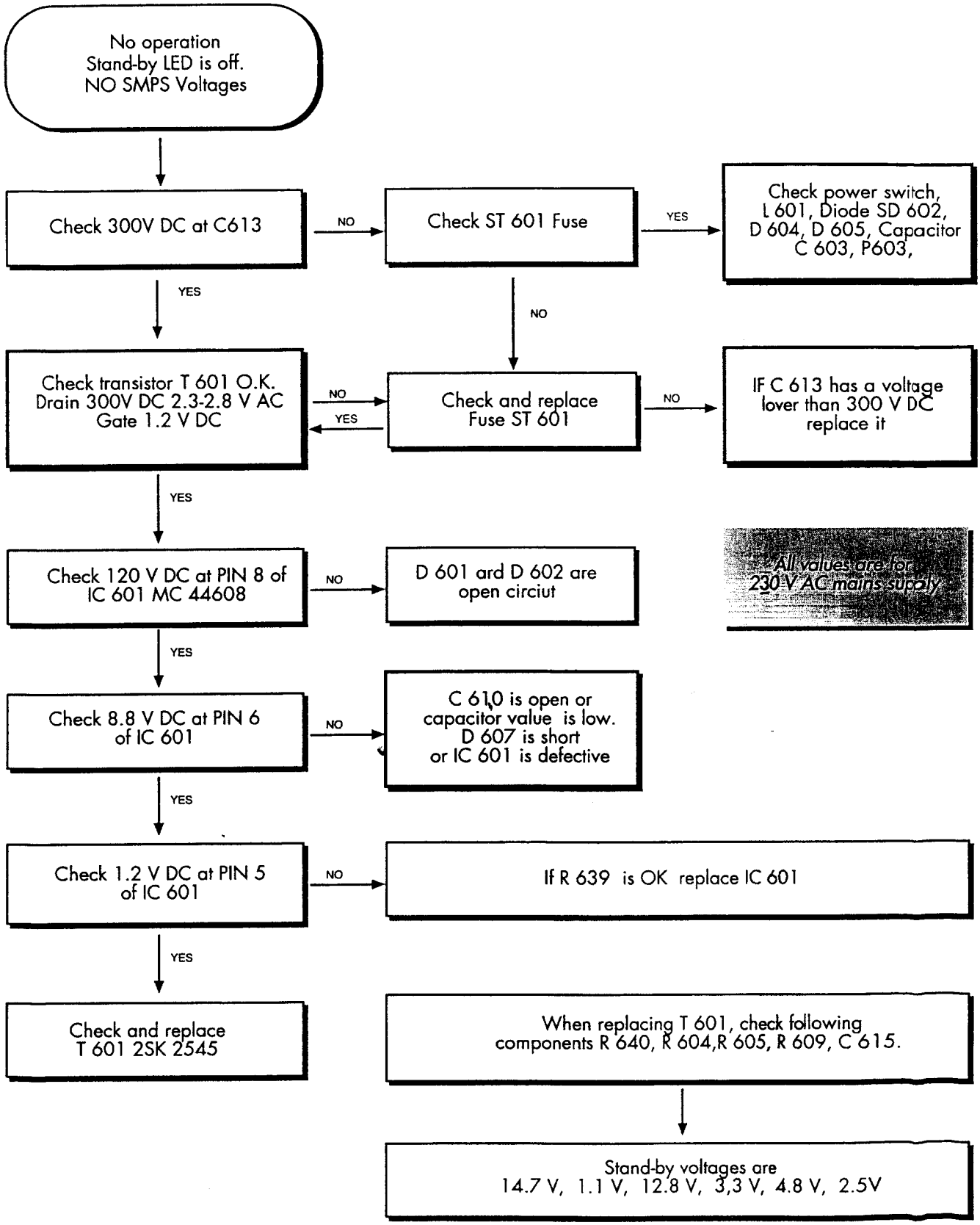
Adjust	BRI	to	20
For 28"	CDR	to	03
	CON	to	28
	HUE	to	20
	SAT	to	14
	YDLY	to	04

4- Screen and White Balance adjustment

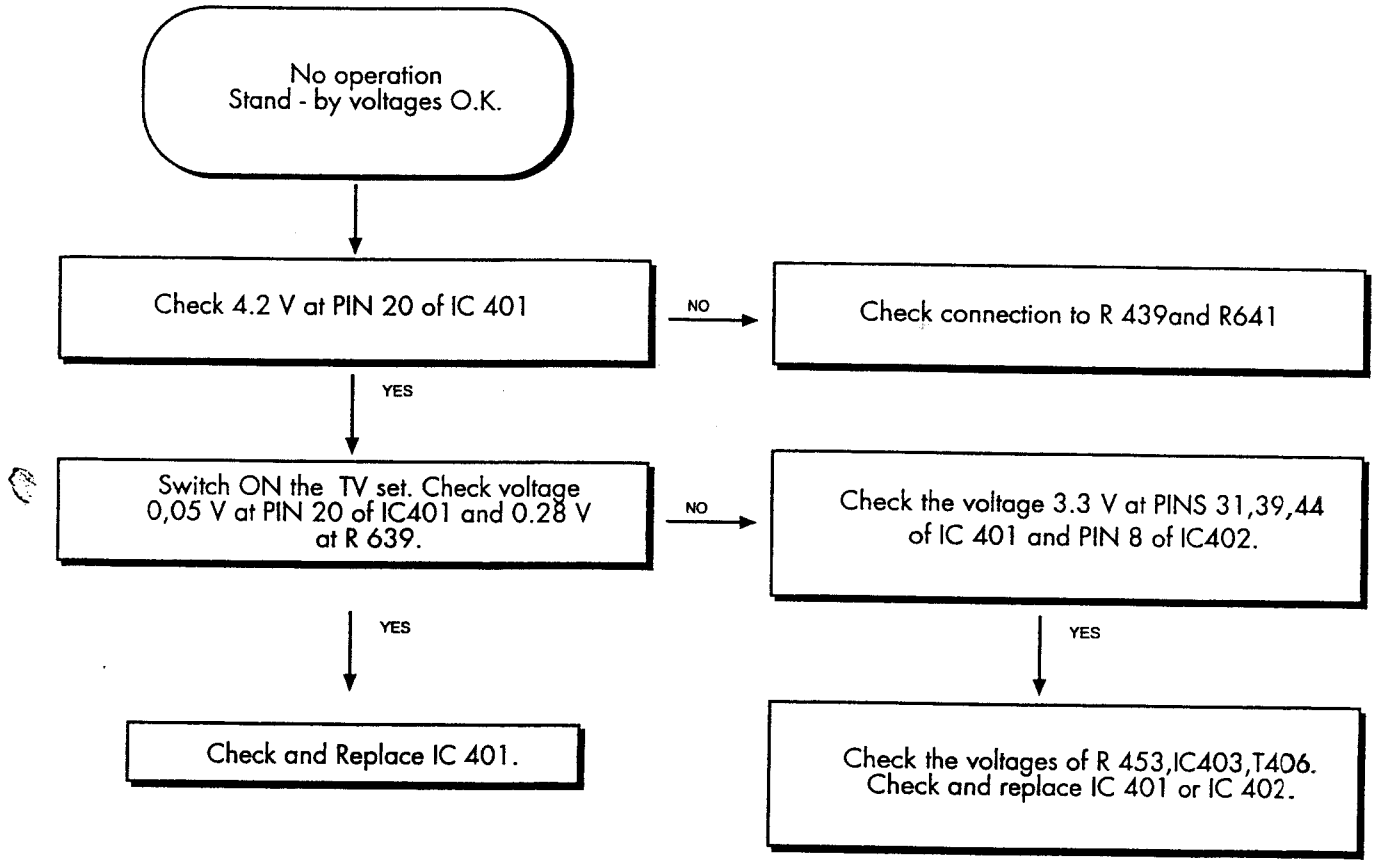
Adjust Brighteness to 30, Contrast to 40 and colour to 20.
Enter Service Mode.
Select SCRN (Screen) and switch it to ON.
Screen becomes black and a horizontal line appears at the center of the screen.
Adjust with screen potentiameter this line to a just visiable level.
Return to picture mode by pressing V+ or V- button.

Select GRN and adjust it 25.
Adjust RED and BLUE to proper
values to have a proper white level.

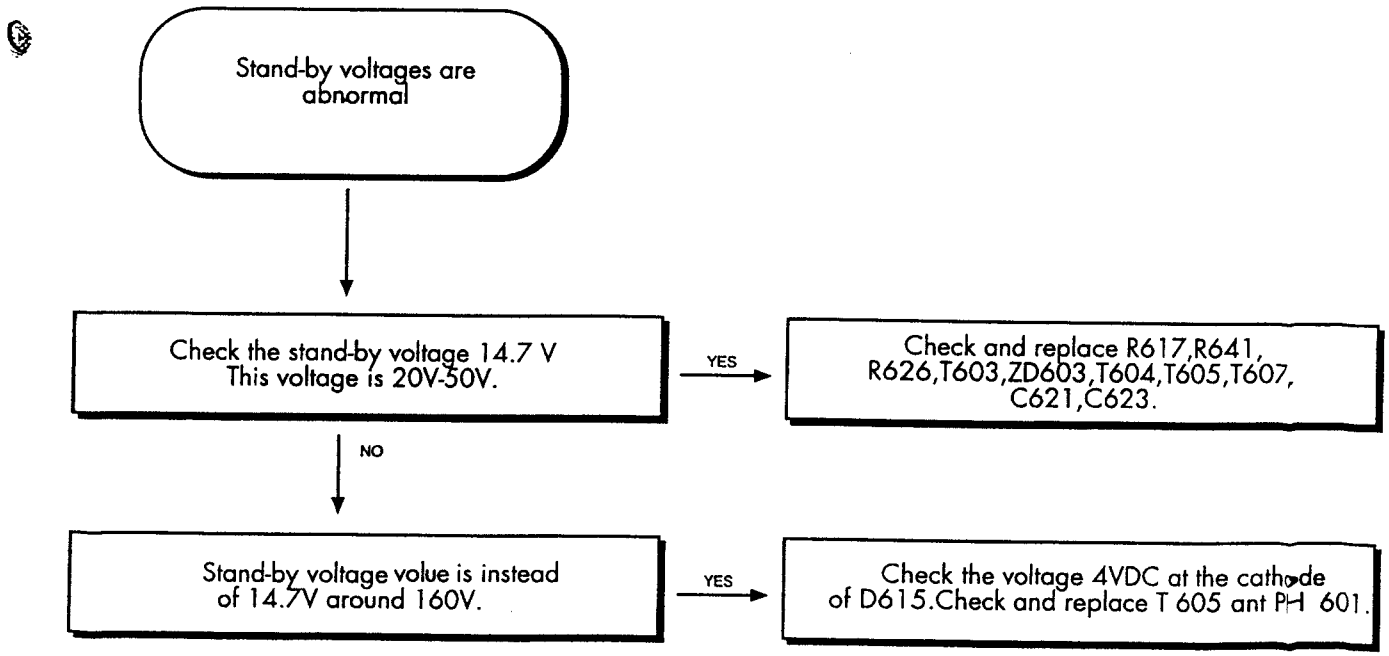
POWER SUPPLY DEFECTS (I)


No operation
Stand-by LED is off.
NO SMPS Voltages
Check 300V DC at C613
NO
Check ST 601 Fuse
YES
Check power switch, L 601, Diode SD 602, D 604, D 605, Capacitor C 603, P603,
YES
NO
Check transistor T 601 O.K.
Drain 300V DC 2.3-2.8 V AC
Gate 1.2 V DC
NO
YES
Check and replace Fuse ST 601
NO
IF C 613 has a voltage lover than 300 V DC replace it
YES
Check 120 V DC at PIN 8 of IC 601 MC 44608
NO
D 601 ard D 602 are open circiut
*All values are for 230 V AC mains supply
YES
Check 8.8 V DC at PIN 6 of IC 601
NO
C 610 is open or capacitor value is low. D 607 is short or IC 601 is defective
YES
Check 1.2 V DC at PIN 5 of IC 601
NO
If R 639 is OK replace IC 601
YES
Check and replace T 601 2SK 2545
When replacing T 601, check following components R 640, R 604,R 605, R 609, C 615.
Stand-by voltages are
14.7 V, 1.1 V, 12.8 V, 3,3 V, 4.8 V, 2.5V

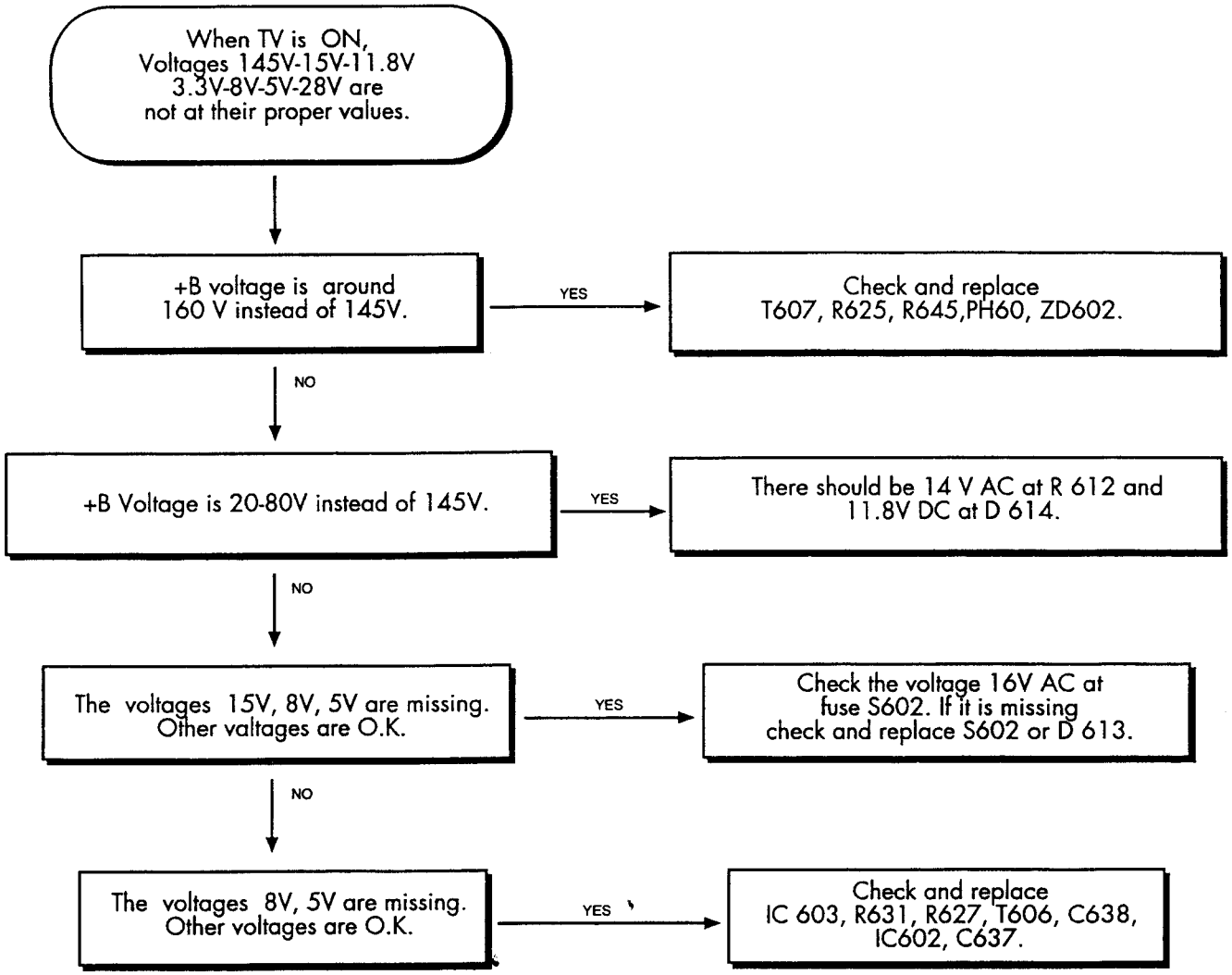
POWER SUPPLY DEFECTS (II)


No operation
Stand - by voltages O.K.
Check 4.2 V at PIN 20 of IC 401
NO
Check connection to R 439and R641
YES
Switch ON the TV set. Check voltage 0,05 V at PIN 20 of IC401 and 0.28 V at R 639.
NO
Check the voltage 3.3 V at PINS 31,39,44 of IC 401 and PIN 8 of IC402.
YES
YES
Check and Replace IC 401.
Check the voltages of R 453,IC403,T406. Check and replace IC 401 or IC 402.

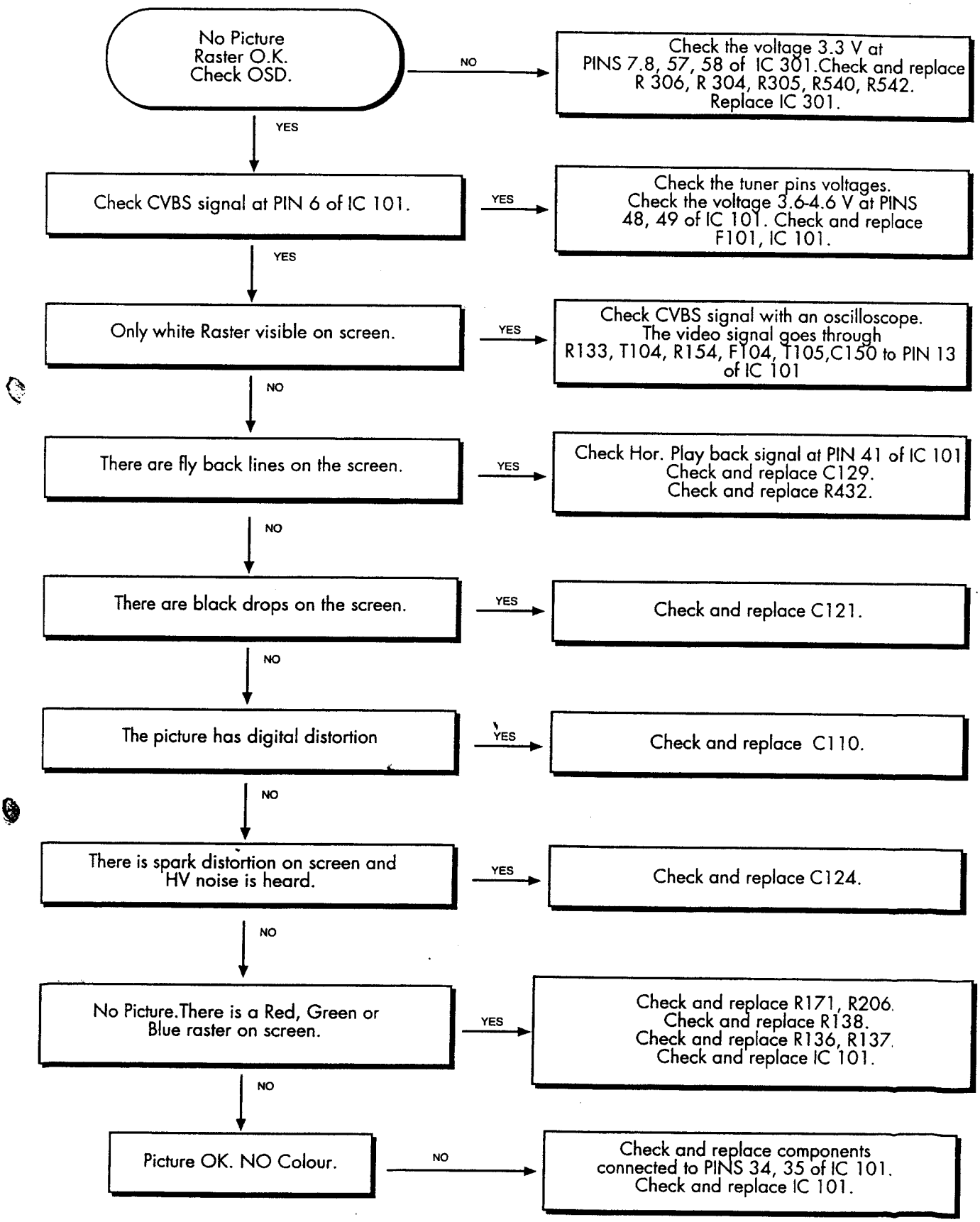
POWER SUPPLY DEFECT (III)


Stand-by voltages are abnormal
Check the stand-by voltage 14.7 V This voltage is 20V-50V.
YES
Check and replace R617,R641, R626,T603,ZD603,T604,T605,T607, C621,C623.
NO
Stand-by voltage volue is instead of 14.7V around 160V.
YES
Check the voltage 4VDC at the cathode of D615.Check and replace T 605 ant PH 601.

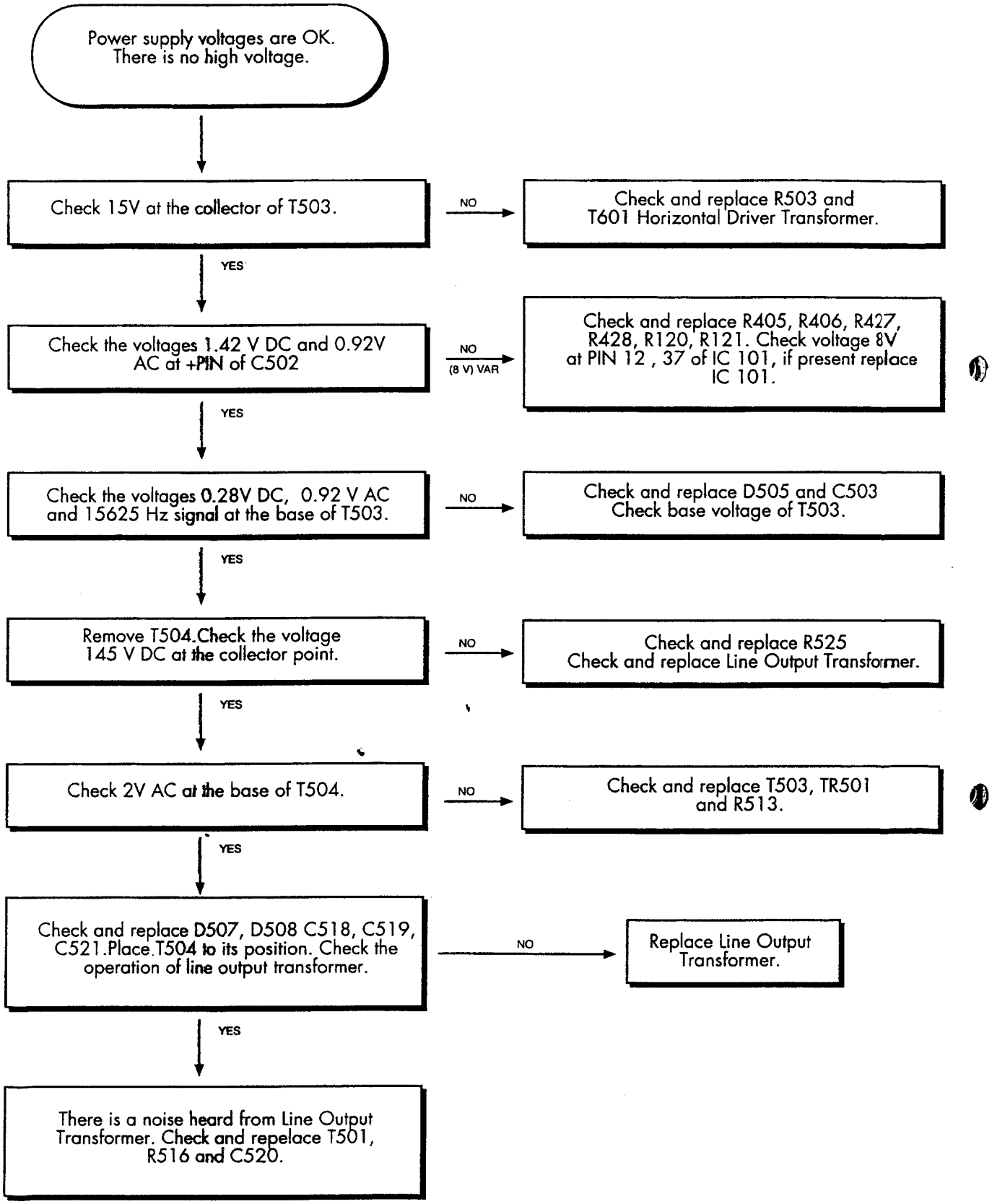
POWER SUPPLY DEFECT (IV)



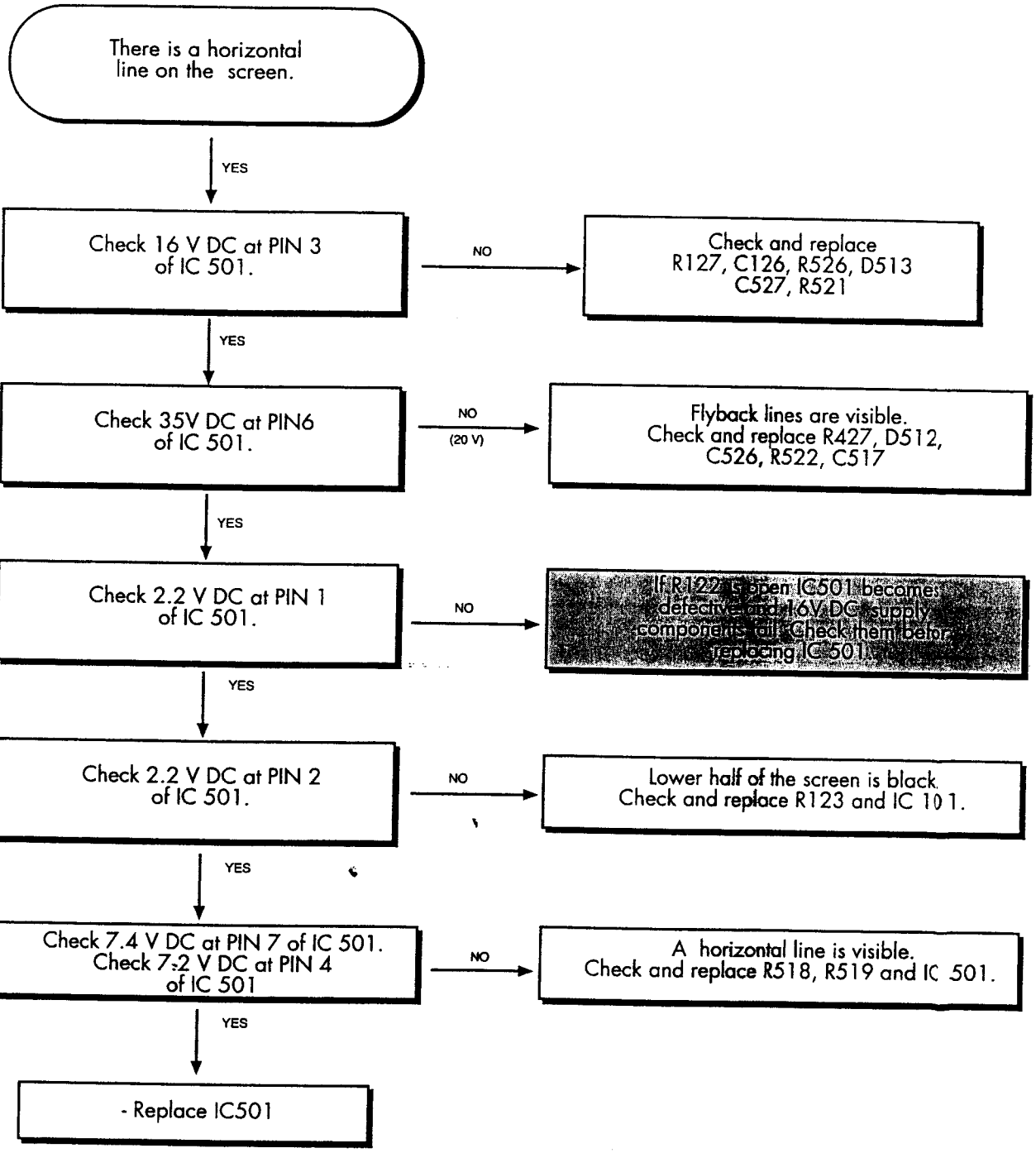
PICTURE AND COLOUR DEFECT


No Picture
Raster O.K.
Check OSD.
NO
Check the voltage 3.3 V at PINS 7.8, 57, 58 of IC 301.Check and replace R 306, R 304, R305, R540, R542. Replace IC 301.
YES
Check CVBS signal at PIN 6 of IC 101.
YES
Check the tuner pins voltages. Check the voltage 3.6-4.6 V at PINS 48, 49 of IC 101. Check and replace F101, IC 101.
YES
Only white Raster visible on screen.
YES
Check CVBS signal with an oscilloscope. The video signal goes through R133, T104, R154, F104, T105,C150 to PIN 13 of IC 101
NO
There are fly back lines on the screen.
YES
Check Hor. Play back signal at PIN 41 of IC 101 Check and replace C129. Check and replace R432.
NO
There are black drops on the screen.
YES
Check and replace C121.
NO
The picture has digital distortion
YES
Check and replace C110.
NO
There is spark distortion on screen and HV noise is heard.
YES
Check and replace C124.
NO
No Picture.There is a Red, Green or Blue raster on screen.
YES
Check and replace R171, R206. Check and replace R138. Check and replace R136, R137. Check and replace IC 101.
NO
Picture OK. NO Colour.
NO
Check and replace components connected to PINS 34, 35 of IC 101. Check and replace IC 101.

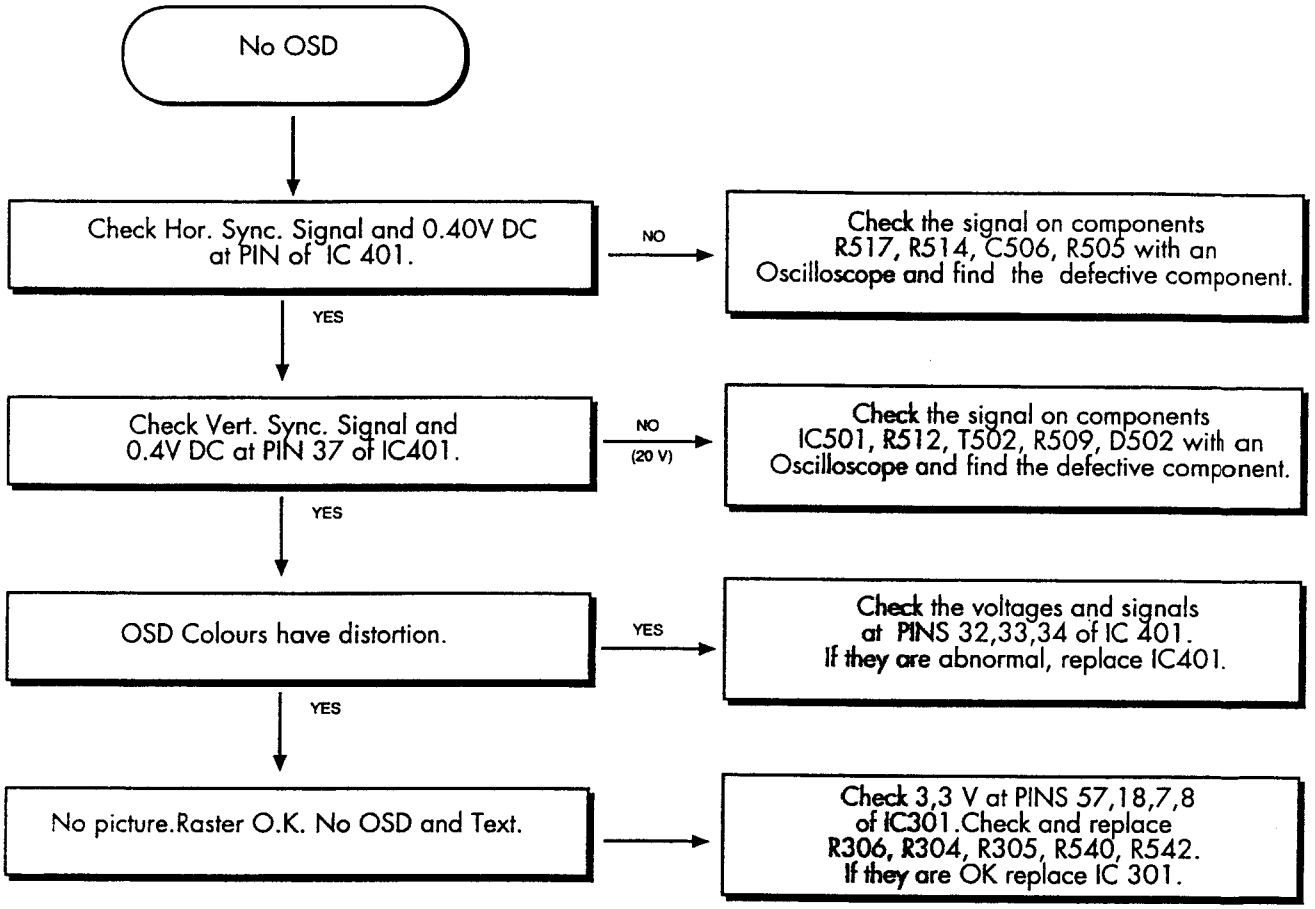
HORİZONTAL DEFLECTION CIRCUİT DEFECTS


Power supply voltages are OK. There is no high voltage.
Check 15V at the collector of T503.
NO
Check and replace R503 and T601 Horizontal Driver Transformer.
YES
Check the voltages 1.42 V DC and 0.92V AC at +PIN of C502
NO (8 V) VAR
Check and replace R405, R406, R427, R428, R120, R121. Check voltage 8V at PIN 12 , 37 of IC 101, if present replace IC 101.
YES
Check the voltages 0.28V DC, 0.92 V AC and 15625 Hz signal at the base of T503.
NO
Check and replace D505 and C503 Check base voltage of T503.
YES
Remove T504.Check the voltage 145 V DC at the collector point.
NO
Check and replace R525 Check and replace Line Output Transformer.
YES
Check 2V AC at the base of T504.
NO
Check and replace T503, TR501 and R513.
YES
Check and replace D507, D508 C518, C519, C521.Place.T504 to its position. Check the operation of line output transformer.
NO
Replace Line Output Transformer.
YES
There is a noise heard from Line Output Transformer. Check and repelace T501, R516 and C520.

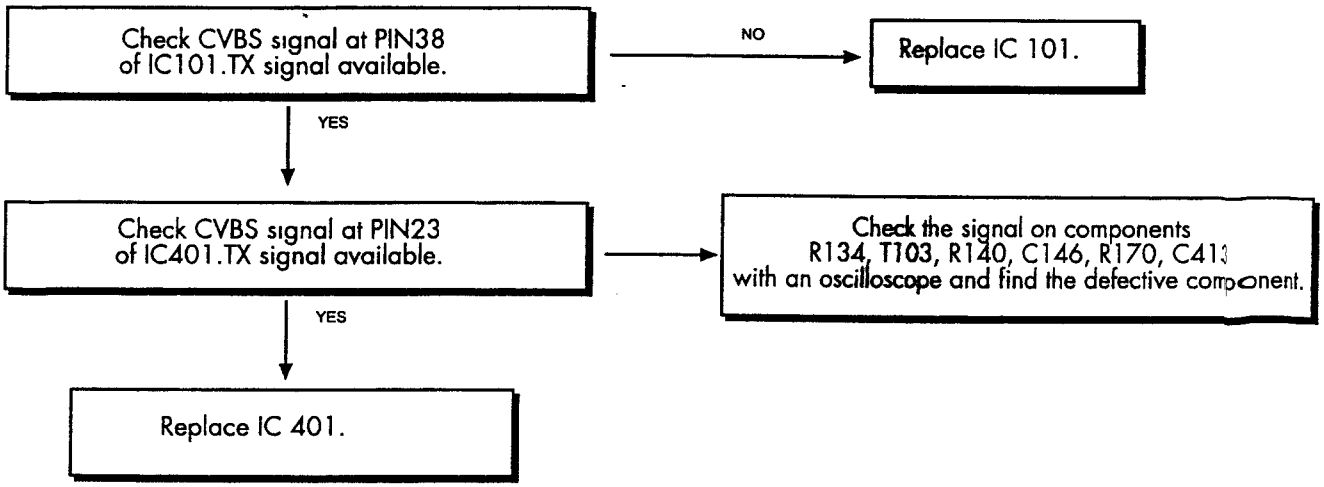
VERTIKAL DEFLECTION CIRCUIT DEFECTS


There is a horizontal line on the screen.
YES
Check 16 V DC at PIN 3 of IC 501.
NO
Check and replace R127, C126, R526, D513 C527, R521
YES
Check 35V DC at PIN6 of IC 501.
NO (20 V)
Flyback lines are visible. Check and replace R427, D512, C526, R522, C517
YES
Check 2.2 V DC at PIN 1 of IC 501.
NO
If R122 is open IC501 become defective and 16V DC supply components fail. Check them befor replacing IC 501.
YES
Check 2.2 V DC at PIN 2 of IC 501.
NO
Lower half of the screen is black. Check and replace R123 and IC 101.
YES
Check 7.4 V DC at PIN 7 of IC 501. Check 7.2 V DC at PIN 4 of IC 501
NO
A horizontal line is visible. Check and replace R518, R519 and IC 501.
YES
- Replace IC501

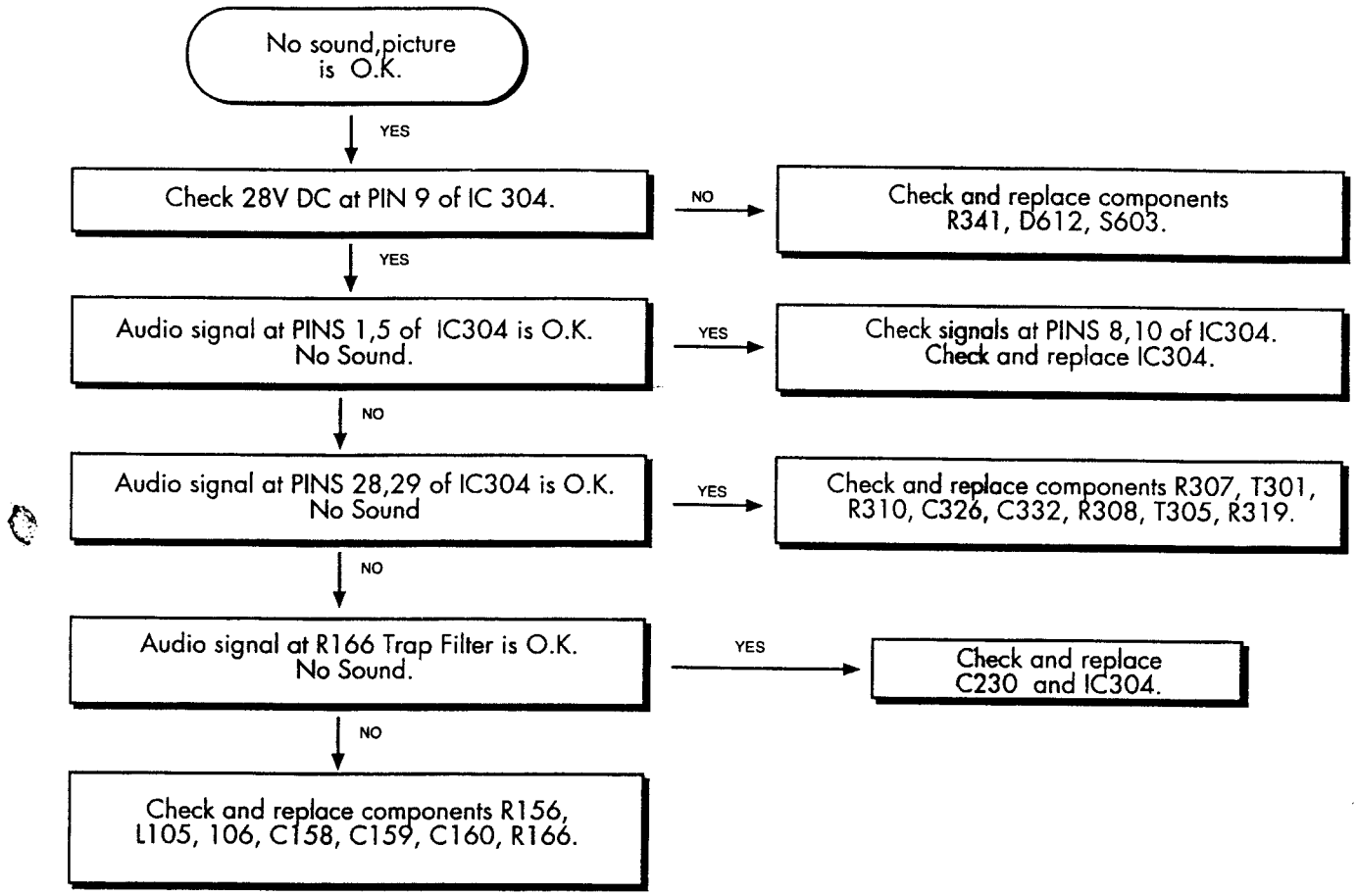
OSD DEFECTS


No OSD
Check Hor. Sync. Signal and 0.40V DC at PIN of IC 401.
NO
Check the signal on components R517, R514, C506, R505 with an Oscilloscope and find the defective component.
YES
Check Vert. Sync. Signal and 0.4V DC at PIN 37 of IC401.
NO
(20 V)
Check the signal on components IC501, R512, T502, R509, D502 with an Oscilloscope and find the defective component.
YES
OSD Colours have distortion.
YES
Check the voltages and signals at PINS 32,33,34 of IC 401. If they are abnormal, replace IC401.
YES
No picture.Raster O.K. No OSD and Text.
Check 3,3 V at PINS 57,18,7,8 of IC301.Check and replace R306, R304, R305, R540, R542. If they are OK replace IC 301.

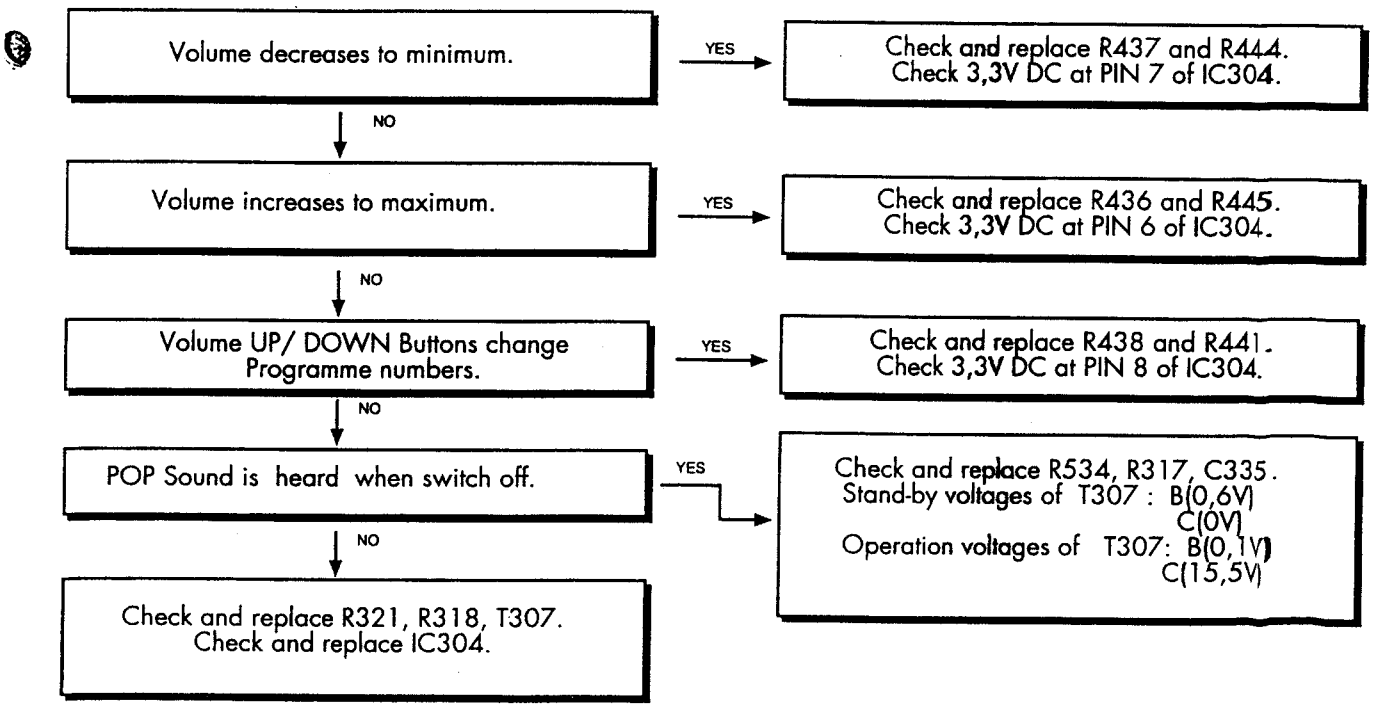
TELETEXT DEFECTS


Check CVBS signal at PIN38 of IC101.TX signal available.
NO
Replace IC 101.
YES
Check CVBS signal at PIN23 of IC401.TX signal available.
Check the signal on components R134, T103, R140, C146, R170, C413 with an oscilloscope and find the defective component.
YES
Replace IC 401.

AUDIO DEFECTS (I)


No sound,picture is O.K.
YES
Check 28V DC at PIN 9 of IC 304.
NO
Check and replace components R341, D612, S603.
YES
Audio signal at PINS 1,5 of IC304 is O.K. No Sound.
YES
Check signals at PINS 8,10 of IC304. Check and replace IC304.
NO
Audio signal at PINS 28,29 of IC304 is O.K. No Sound
YES
Check and replace components R307, T301, R310, C326, C332, R308, T305, R319.
NO
Audio signal at R166 Trap Filter is O.K. No Sound.
YES
Check and replace C230 and IC304.
NO
Check and replace components R156, L105, 106, C158, C159, C160, R166.

AUDIO DEFECTS (II)


Volume decreases to minimum.
YES
Check and replace R437 and R444. Check 3,3V DC at PIN 7 of IC304.
NO
Volume increases to maximum.
YES
Check and replace R436 and R445. Check 3,3V DC at PIN 6 of IC304.
NO
Volume UP/ DOWN Buttons change Programme numbers.
YES
Check and replace R438 and R441. Check 3,3V DC at PIN 8 of IC304.
NO
POP Sound is heard when switch off.
YES
Check and replace R534, R317, C335.
Stand-by voltages of T307 : B(0,6V) C(0V)
Operation voltages of T307: B(0,1V) C(15,5V)
NO
Check and replace R321, R318, T307. Check and replace IC304.

CONVERGENCE ADJUSTMENTS

Note: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

• Centre Convergence Adjustment

1. Receive crosshatch pattern with a colour bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure) and superimpose red and blue vertical lines in the central area of the picture screen. (See figure).
4. Turn both tabs at the same time keeping the constant angle to superimpose red and blue horizontal lines at the centre of the screen. (See figure)
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3,4,5 to ensure best convergence, the adjustment must be undertaken with great care because of the interaction between 4 and 6 pole magnets.

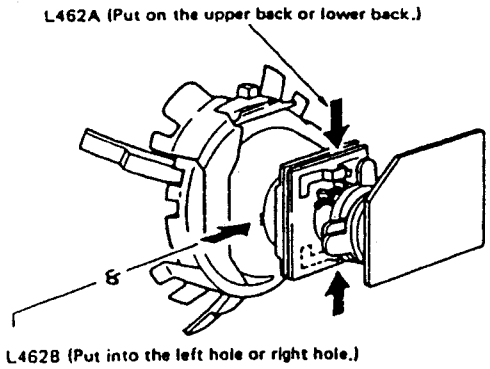
• Circumference Convergence Adjustment

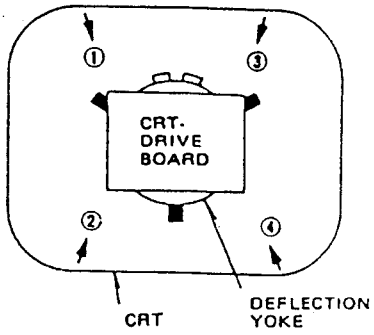
1. Loosen the clamping screw of deflection yoke to allow the yoke to tilt.
2. Put a wedge as shown in figure temporarily. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure)
6. Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, re
the yoke is firm.
9. Stick 3 adhesive tapes on wedges.

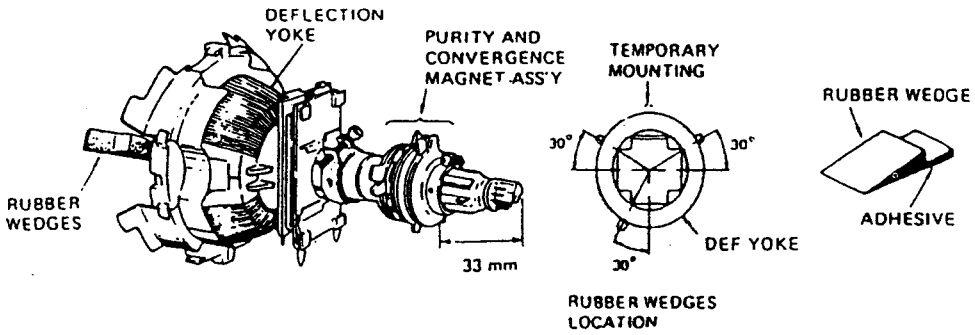
CONVERGENCE COMPENSATOR

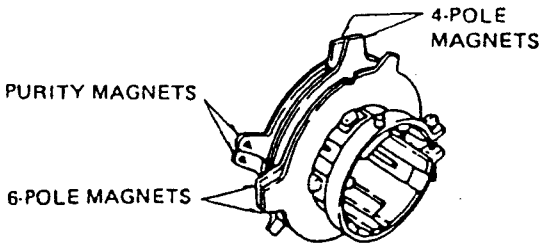
Compensators L462A and L462B are used to correct misconvergence (Red-Green) at the top centre or bottom centre on screen, when the misconvergence is still evident even though the yoke adjustment is tried. Compensator L462C is also used to correct misconvergence (Vertical shift of Red or Blue) at four corners on screen.

1. To correct horizontal misconvergence (Red-Green), put compensator L462A on the yoke back (see figure) to find a position for minimizing misconvergence. Mark the position and remove protective paper on the rear of L462A to stick it in place. Apply adhesives on buth yoke and L462A.
2. To correct vertical misconvergence (Red-Green), put the tips of compensator L462B into either of the holes on the yoke core and apply adhesives.
3. To correct up or down shift of Red at top right or bottom right corner, put compensator L462C at point 1 ve 2 or the picture tube (see figure.) to find a position for minimizing misconvergence. Mark the position and remove protective paper on the rear of L462C to stick it in place.

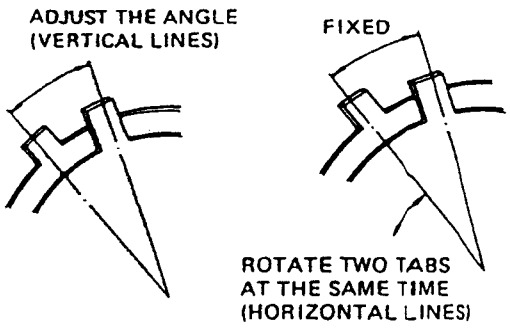




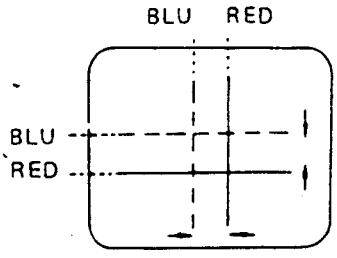




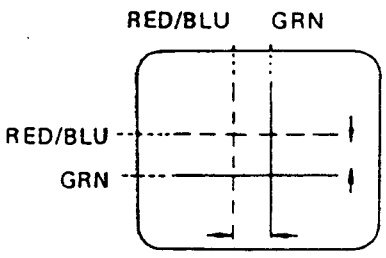
CONVERGENCE MAGNET ASSEMBLY



ADJUSTMENT OF MAGNETS

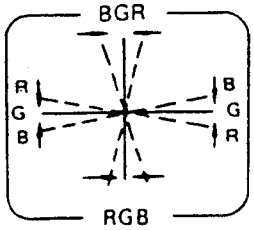


4-POLE MAGNETS MOVEMENT

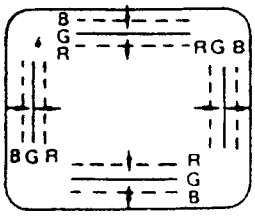


6-POLE MAGNETS MOVEMENT

Centre Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF Yoke

Dot Movement Pattern

SUPLEMENT FOR
14.1 SERVICE MANUAL

I²C-bus controlled PAL/NTSC/SECAM TV processors

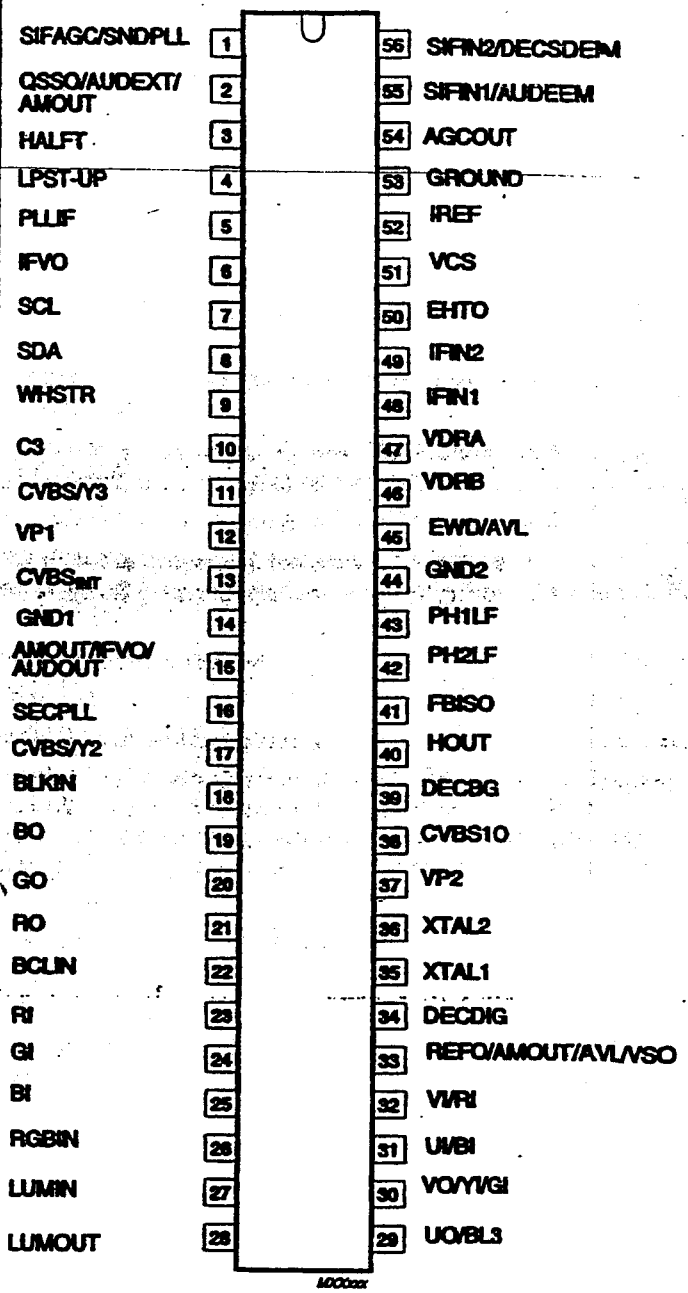
TDA8874

FEATURES

The following features are available in all ICs:

- Multi-standard vision IF circuit with an alignment-free PLL demodulator without external components
- Internal (switchable) time-constant for the IF-AGC circuit
- Switchable sound trap and group delay correction circuit for the demodulated CVBS signal
- Flexible source selection with CVBS switch and a Y(CVBS)/C input so that a comb filter can be applied
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delay time
- Integrated chroma band-pass filter with switchable centre frequency
- Colour decoder which needs only one 12 MHz reference crystal (or external clock signal) for all standards
- Blanking of the 'helper signals' for PAL^{PLUS} and EDTV-2
- Several picture improvement features. The feature content of the various versions can be found in the table on page 3.
- Internal base-band delay line
- YUV interface
- Linear RGB input and fast blanking
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level off-set adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Adjustable peak white limiting circuit
- Half-tone (contrast reduction) possibility during mixed-mode of OSD and text signals
- Possibility to insert a 'blue back' option when no video signal is available
- Horizontal synchronization with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimized for DC-coupled vertical output stages for improved geometry
- Vertical geometry processing.
- Low-power start-up for the horizontal drive circuit
- I²C-bus control of various functions
- 2 different slave addresses for I²C-bus control

The detailed differences between the various ICs are given in the table on page 3.



TDA8874

Pin configuration (SDIP56).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
Supply					
V_P	supply voltage	–	8.0	–	V
I_P	supply current	–	tbf	–	mA
Input voltages					
$V_{i(VIF)(rms)}$	video IF amplifier sensitivity (RMS value)	–	35	–	µV
$V_{i(SIF)(rms)}$	sound IF amplifier sensitivity (RMS value)	–	60	–	µV
$V_{i(CVBS/Y)(p-p)}$	external CVBS/Y input (peak-to-peak value)	–	1.0	–	V
$V_{i(CHROMA)(p-p)}$	external chroma input voltage (burst amplitude) (peak-to-peak value)	–	0.3	–	V
$V_{i(RGB)(p-p)}$	RGB inputs (peak-to-peak value)	–	0.7	–	V
$V_{i(Y)(p-p)}$	luminance input signal (peak-to-peak value)	–	1.4 / 1.0	–	V
$V_{i(U)(p-p)}$ / $V_{i(PB)(p-p)}$	U / P_B input signal (peak-to-peak value)	–	−1.33/+0.7	–	V
$V_{i(V)(p-p)}$ / $V_{i(PR)(p-p)}$	V / P_R input signal (peak-to-peak value)	–	−1.05/+0.7	–	V
Output signals					
$V_{o(IFVO)(p-p)}$	demodulated CVBS output (peak-to-peak value)	–	2.5	–	V
$I_{o(AGCOUT)}$	tuner AGC output current range	0	–	5	mA
$V_{o(QSSO)(rms)}$	sound IF intercarrier output (RMS value)	–	100	–	mV
$V_{o(AMOUT)(rms)}$	demodulated AM sound output (RMS value)	–	500	–	mV
$V_{o(CVBSO)(p-p)}$	CVBS output voltage video switch (peak-to-peak value)	–	2.0	–	V
$V_{o(VO/I)(p-p)}$	−V output/input voltage (peak-to-peak value)	–	1.05	–	V
$V_{o(UO/I)(p-p)}$	−U output/input voltage (peak-to-peak value)	–	1.33	–	V
$V_{o(YO/I)(p-p)}$	Y output/input voltage (peak-to-peak value)	–	1.4	–	V
$V_{o(RGB)(p-p)}$	RGB output signal amplitudes (peak-to-peak value)	–	2.0	–	V
$I_{o(HOUT)}$	horizontal output current	10	–	–	mA
$I_{o(VERT)}$	vertical output current (peak-to-peak value)	–	1	–	mA
$I_{o(EWD)}$	EW drive output current	−1.2	–	–	mA

IC VERSION (TDA88)	74
TV range	110°
QSS sound IF amplifier	√
AM sound demodulator	√
PAL decoder	√
SECAM decoder	√
NTSC decoder	√
Additional RGB/YUV input	√
Black stretch and Blue stretch	√
Dynamic skin tone control and coring on complete video signal	√
Horizontal geometry (EW)	√
Horizontal and vertical zoom	√

PIN		SYMBOL	FM-PLL VERSIONS	QSS VERSIONS
SDIP56	QFP64			
27	39	LUMIN	luminance input	
28	40	LUMOUT	luminance output	
–	41	RI2	2nd V/R input	
–	42	GI2	2nd Y/G input	
–	43	BI2	2nd U/B input	
–	44	RGBIN2	2nd RGB insertion input	
29	45	UO/BL3	U signal output or YUV-RGB insertion input (4)	
30	46	VO/YI/GI	V signal output or Y input or G input (4)	
31	47	UI/BI	U or B signal input (4)	
32	48	VI/RI	V or R signal input (4)	
33	49	REFO/ AMOUT/ AVL/VSO	Ref. signal out or AVL or V-sync out (5)	Ref. signal out or AM out or V-sync out (5)
34	50	DECDIG	decoupling digital supply	
35	51	XTAL1	12 MHz crystal connection	
36	52	XTAL2	12 MHz crystal connection	
37	53	VP2	2nd supply voltage (+8 V) (colour decoder, control, synchronisation and geometry)	
38	54	CVBS1O	CVBS-1 output	
39	55	DECBG	bandgap decoupling	
40	56	HOUT	horizontal output	
41	57	FBISO	flyback input / sandcastle output	
42	58	PH2LF	phase-2 filter	
43	59	PH1LF	phase-1 filter	
–	60	SWO2	output switch 2 (I²C)	
44	61	GND2	ground 2 (filters, CTI, control and geometry)	
45	62	EWD/AVL	east-west drive output / Automatic Volume Levelling	
46	63	VDRB	vertical drive B output	
47	64	VDRA	vertical drive A output	

Multistandard Sound Processor Family with Dolby Surround Pro Logic

The hardware and software description in this document is valid for the MSP 34x2G version A1 and following versions.

Introduction

The MSP 34x2G family of single-chip Multistandard Sound Processors covers the sound processing of all analog TV-Standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed on a single chip.

The family's latest member, the MSP 3452G has all functions of the MSP 3450G with the addition of Dolby Surround Pro Logic and Virtual Dolby Surround sound processing (See License Notice on page 5). The MSP 3452G forms a superset of the functions of the MSP 3451G, which contains the virtualizer algorithms but does not contain any multi-channel processing.

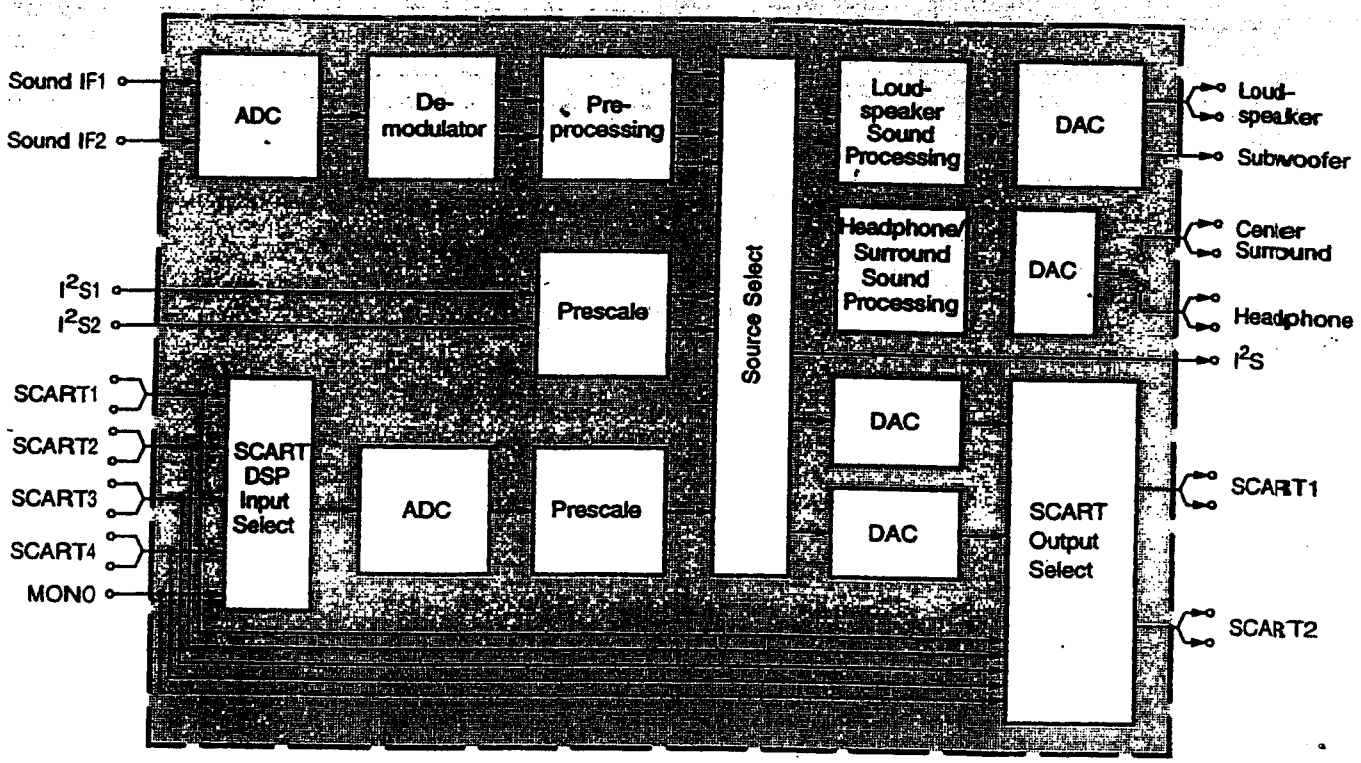
Additional output pins DACM_C and DACM_S have been defined which deliver the Dolby Surround Pro Logic processed Center and Surround channels. When DACM_C and DACM_S are active, the headphone outputs DACA_L and DACA_R are muted and vice versa. Simultaneous processing of Headphone signals and Dolby Surround Pro Logic is not possible.

Surround sound can be reproduced to a certain extent with only two loudspeakers. The MSP 3452G includes a Micronas virtualizer algorithm which has been approved by the Dolby[1)] Laboratories for compliance with the "Virtual Dolby Surround" technology. This algorithm is called "3D-PANORAMA" and enables convincing acoustical sensations. Virtual Dolby Surround can be processed together with headphone signals.

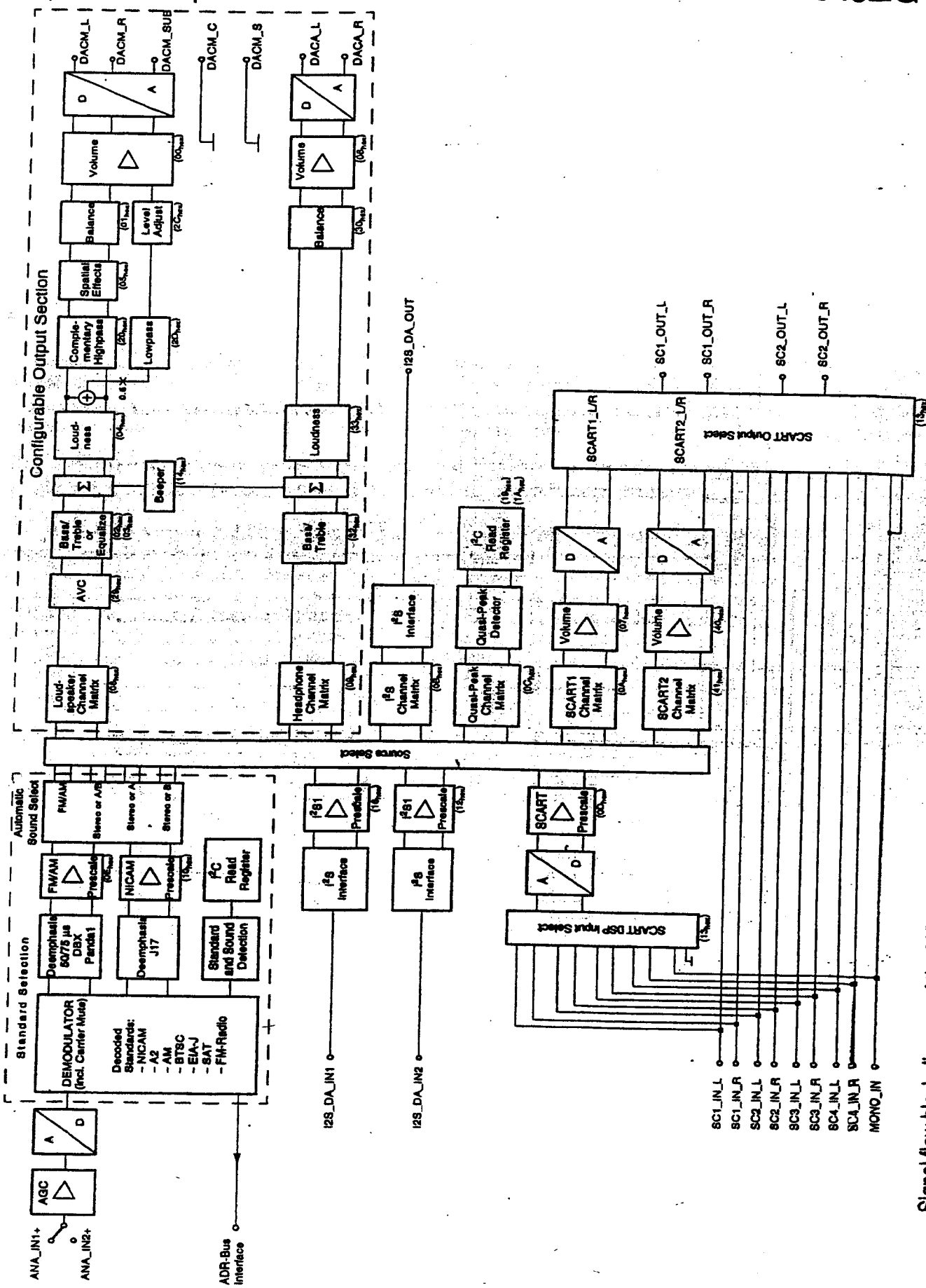
The ICs are produced in submicron CMOS technology. The MSP 34x2G is available in the following packages: PSDIP64, PQFP80, and PLQFP64.

Features

- All MSP 3450G features
- All MSP 3451G features as there are
  - the 3D-PANORAMA virtualizer algorithm
  - the PANORAMA virtualizer algorithm
  - Noise Generator
- Dolby Surround Pro Logic processing
- Various other multichannel sound modes
- Additional pins for Center and Surround channels
- Virtualizer able to work with 2 or 3 front loudspeakers
- Pin and software compatible to MSP 34x0G



Block diagram of the MSP 3452G



Signal flow block diagram of the MSP 3452G without any surround processing: Output Configuration (register 48_{hex}) = 0000_{hex}

ADDITIONAL COMPONENTS FOR SECAM LL' NICAM SETS

PART NUMBER	DESCRIPTION	POSITION		
7UT140	B4 PS LL NICAM MODULU			
7RZ136-PH3	TUNER PH ASIMETRIK UV1316/ALG-3	TU101		
056946	KRISTAL 12MHZ	Q103		
056709	SAW FILTRE OFW	F101		
452783	IC TDA 8874-N1	IC101		
452782	IC SAA 5564PS-M3 LL VER. 1.3	IC401		
303195	DIODE 4148 MELF	D102		
294231	CC-CHIP 220NF K 16V /0805 X	C174	C175	
294111	CC-CHIP 100NF K 25V /0805 X	C166	C167	
292223	CC-CHIP 2.2NF K 50V /0805 X	C129		
290473	CC-CHIP 47PF J 50V /0805 NPO	C404		
290334	CC-CHIP 33PF J 50V /0805 NP	C115	C117	
259223	EC 2.2UF 63V 11*5 R:5	C139	C165	
251152	C-ELA 150UF 10V 11*MAX 6.3 R:5	C102		
250113	C-ELA 1UF 25V 11*5 R:5	C142		
179002	RC-CHIP 0R/1206	L104	R173	
179001	RC-CHIP 0R/0805 2*1.25	R196	R174	R125
173121	SMD RES-12K 1/8W /1206 (TR	R176		
170473	CFR-CHIP 47R J 1/8W /1206	R179		
101343	RC 330R J 1/4W/6 26MM	R415		

ADDITIONAL COMPONENTS FOR SECAM LL' MONO SETS

PART NUMBER	DESCRIPTION	POSITION
7UT150	B4 PS LL MONO MODULU	
056708	SAW FILTRE OFW K3958M	F101
053743	BOBIN-CHIP 2.2UH K/0805	L103
053740	BOBIN 1UH K LAL03	F105
171223	RC-CHIP 220R J 1/8W /1206	R442
173101	RC-CHIP 10K J 1/10W /0805	R450
179001	RC-CHIP 0R /0805 2*1.25	R179
290473	CC-CHIP 47PF J 50V /0805 NPO	C423
291152	CC-CHIP 150PF J 50V /0805 NP0	C182

ADDITIONAL COMPONENTS FOR SECAM LL' DOLBY PROLOGIC SETS

PART NUMBER	DESCRIPTION	POSITION	
452602	IC MSP3452G	IC301	
452482	IC TDA7263	IC303	
401142	TRN-CHIP BC858B SOT23	T302	T304
401141	TRN-CHIP BC848B SOT23	T310	T311
292110	CC-CHIP 1NF K 50V /0805 X7R	C323	C324
292105	CC-CHIP 1NF K 50V /1206 X7R	C334	C336
291473	CC-CHIP 470PF K 50V /0805 X7R	C366	C367
253101	C-ELA 1000UF 35V 25*13 R:5	C340	
252476	C-ELA 470UF 25V 11*10 R:5	C356	C357
251478	C-ELA 47UF 16V 11*5 R:5	C344	C346
175102	RC-CHIP 1M J 1/10W /0805	R344	R346
173101	RC-CHIP 10K J 1/10W /0805	R343	R345
172335	RC-CHIP 3.3K J 1/10W /0805	R314	R315
172180	RC-CHIP 1.8K J 1/8W /1206	R322	
172105	RC-CHIP 1K J 1/8W /1206	R309	R311
170473	RC-CHIP 47R J 1/8W /1206	R327	
140472	RC 47R J 1/4W /3.2 26MM	R331	
109474	RC 4.7R J 1/2W /9 26MM	R335	R337

ADDITIONAL COMPONENTS FOR BG DOLBY PROLOGIC SETS

056743	SAW FILTRE OFW G3963M	F101
056744	SAW FILTRE OFW G9353M	F107
119104	RWF 1R J 1.5W (UFLB) 73MM	R341
171910	RC-CHIP 910R J 1/8W/1206	R328

14.1 CTV CHASSIS

7 SZ 820-06

	L104	L107	F101	F102	F104	F105	F106	R535	R536	IC101
BG A2 ONLY	8.2u	-	G1966M	-	TP85.5MB	-	-	OR	-	TDA884X
BG A2+NICAM	8.2u	-	G1966M	-	TP85.5MNA	-	-	OR	-	TDA884X
I	8.2u	-	J1980M	-	TP86.0MB	40.4MHZ	-	OR	-	TDA884X
DK	-	5.6u	K2966M	-	TPT02B	-	40.4MHZ	OR	-	TDA884X
L/L'	OR	-	K3953M	K9456M	-	-	-	OR	OR	TDA8874

	C141	IC101
PAL 90°	-	TDA8841
PAL 110°	-	TDA8843
PAL SECAM 90°	220n 50V	TDA8842
PAL SECAM 110°	220n 50V	TDA8844

	IC301
A2 ONLY	MSP3400D
A2+NICAM	MSP3410D
A2, VIRTUAL DOLBY	MSP3401G
A2+NICAM, VIRTUAL DOLBY	MSP3411G
DOLBY PROLOGIC	MSP34X2G

IC301
A2 ONLY — MSP3400D
A2+NICAM — MSP3410D
A2, VIRTUAL DOLBY — MSP3401G
A2+NICAM, VIRTUAL DOLBY — MSP3411G
DOLBY PROLOGIC — MSP34X2G

R322	C335
Non-Subwoofer & Non-Dolby Pro. — 3.3k 1/8W	22u 35V
Subwoofer — 100R 1/8W	470u 35V
Dolby Prologic — 1.8k 1/8W	22u 35V

	C330	C330A	C336	C340	C344	C346	C356	C347	HS301	X303	CABLE.6	CABLE.7	CABLE.13
SUBWOOFER	-	2.2u 16V	3.3k 1/8W	1000u 35V	220u 16V	220u 16V	2200u 25V	100n 25V	7PZ.304	2pin CONN	—	~	-
DOLBY	100n	-	1n	1000u 35V	47u 16V	47u 16V	470u 25V	-	7VA.304	4pin CONN	—	~	-
	R326	R327	R330	R331	R335	R337	R341	R607	IC303	JP303	JP304	JP305	CABLE.14
SUBWOOFER	1.2k 1/8W	18R 1/8W	1.2k 1/8W	18R 1/8W	1R 1/2W	1R 1/2W	0.47R 2W	0.33R 1W	TDA7262	—	—	—	-
DOLBY	1.5k 1/8W	47R 1/8W	1.5k 1/8W	47R 1/8W	4.7R 1/2W	4.7R 1/2W	0.68R 2W	0.33R 1W	TDA7263	—	—	—	~

OPTION - PROLOGIC

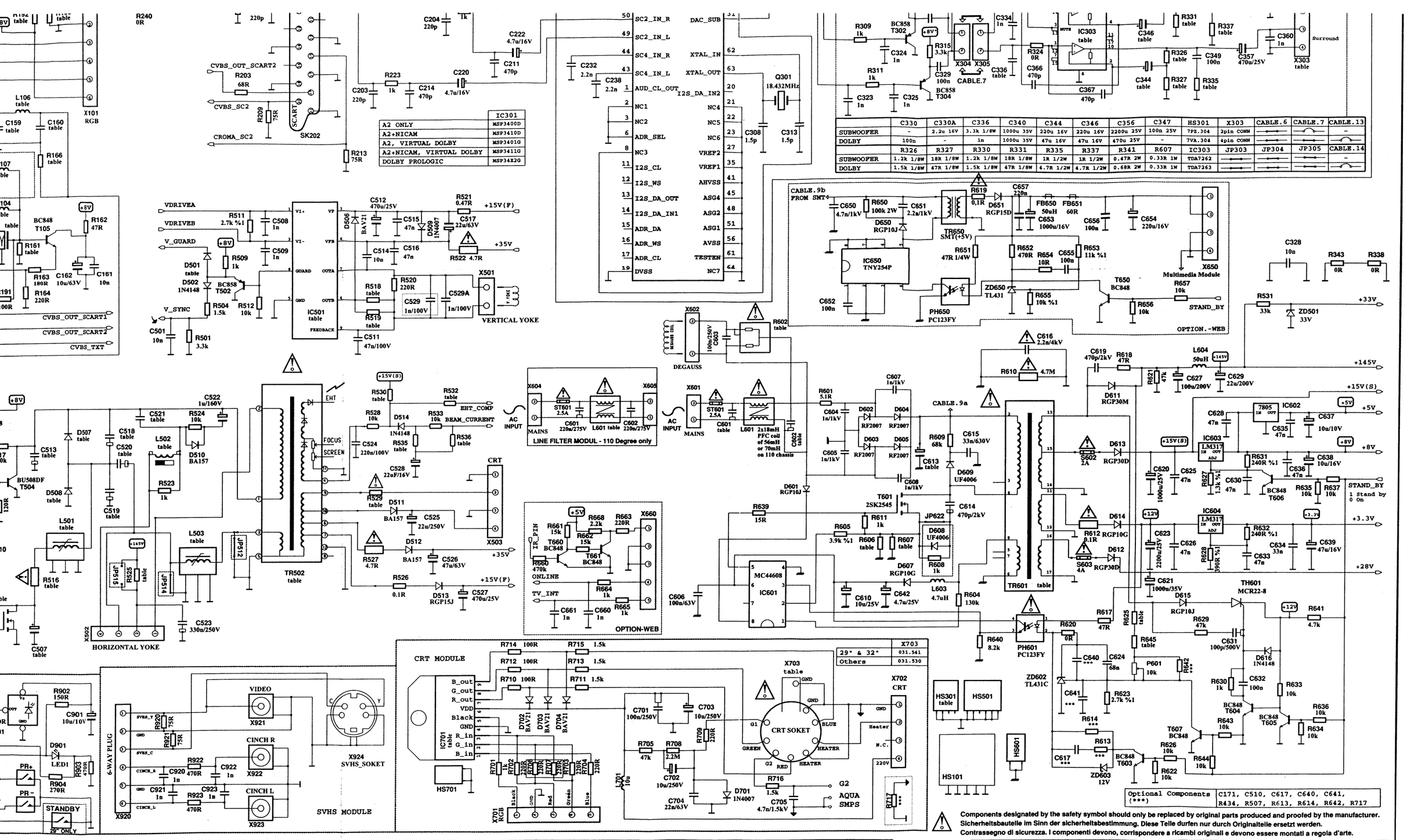
OPTION.-WEB

HEADPHONE MODULE

LINE FILTER MODUL - 110 Degree only

VERTICAL YOKE

DEGAUSS



	C330	C330A	C336	C340	C344	C346	C356	C347	HS301	X303	CABLE.6	CABLE.7	CABLE.13
SUBWOOFER	-	2.2u 16V	3.3k 1/8W	1000u 35V	220u 16V	220u 16V	2200u 25V	100n 25V	7PZ.304	2pin CONN			-
DOLBY	100n	-	1n	1000u 35V	47u 16V	47u 16V	470u 25V	-	7VA.304	4pin CONN			
	R326	R327	R330	R331	R335	R337	R341	R607	IC303	JP303	JP304	JP305	CABLE.14
SUBWOOFER	1.2k 1/8W	18R 1/8W	1.2k 1/8W	18R 1/8W	1R 1/2W	1R 1/2W	0.47R 2W	0.33R 1W	TDA7262				-
DOLBY	1.5k 1/8W	47R 1/8W	1.5k 1/8W	47R 1/8W	4.7R 1/2W	4.7R 1/2W	0.68R 2W	0.33R 1W	TDA7263				

	R601	L501	L502	L503	L601	R518	R519	R525	R529	R530	R532	R602	R607	R625	R645	C513	C518	C519	C520	C521	C613	R328	R332	R341	HS301
29" & 32"	9.034	-	70 uH	-	2x18 mH	2.7R 1/4W	3.3R 1/4W	10R 7W	0.47R 1W	10k 1/4W	-	27R	1R 0.75W	115k 1/4W	5.6k 1/10W	9.1n 1.6KV	-	-	-	390n 250V	150u 400V	1k 1/8W	1k 1/8W	1R 2W	7RZ.304
Others	9.034	-	70 uH	-	2x18 mH	-	1.2R 1/4W	10R 7W	0.1R 0.75W	10k 1/4W	-	27R	1R 0.75W	115k 1/4W	5.6k 1/10W	8.2n 1.6KV	-	-	-	390n 250V	150u 400V	1k 1/8W	1k 1/8W	1R 2W	7RZ.304
	9.034	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	OR	1n 2KV	10n 1.6KV	22n 1KV	560n 250V	470n 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7RZ.304
	9.034	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	OR	1n 2KV	10n 1.6KV	22n 1KV	560n 250V	470n 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7RZ.304
	9.034	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	OR	1n 2KV	11n 1.6KV	22n 1KV	560n 250V	470n 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7VA.304
	9.034	6 mH	45 uH	1.8 mH	2x18 mH	1.2R 1/4W	2.7R 1/4W	1.5R 2W	1.2R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.47R 1/2W	115k 1/4W	33k 1/10W	1n 2KV	12n 1.6KV	18n 1KV	560n 250V	680n 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7RZ.304
	9.034	6 mH	45 uH	1.8 mH	2x18 mH	3.3R 1/4W	1.5R 1/4W	1.5R 2W	1.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	33k 1/10W	1n 2KV	13.1n 1.6KV	15n 1KV	560n 250V	820n 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7RZ.304
	9.034	6 mH	30 uH	1.5 mH	2x18 mH	2.7R 1/4W	1.2R 1/4W	6.7R 7W	0.47R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.33R 1/2W	115k 1/4W	15k 1/10W	1n 2KV	13.1n 1.6KV	22n 1KV	560n 250V	820n 250V	220u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7VA.304
	9.034	6 mH	45 uH	1.5 mH	2x13 mH	2.7R 1/4W	1.5R 1/4W	1.5R 2W	1R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.33R 1/2W	150k 1/4W	10k 1/10W	1.5n 1.6KV	13.1n 1.6KV	22n 1KV	560n 250V	820n 250V	220u 400V	1.5k 1/8W	1.5k 1/8W	1.5R 1.5W	7VA.304
	9.034	6 mH	30 uH	1.5 mH	2x13 mH	1.5R 1/4W	3.3R 1/4W	1.5R 2W	1.5R 1W	6.8k 1/4W	2.2M 1/4W	20R	0.33R 1/2W	150k 1/4W	15k 1/10W	1.5n 1.6KV	11n 1.6KV	22n 1KV	560n 250V	680n 250V	220u 400V	910R 1/8W	910R 1/8W	1R 1.5W	7VA.304
	9.034	6 mH	30 uH	1.5 mH	2x13 mH	1.2R 1/4W	1.5R 1/4W	1.5R 2W	1.8R 1W	6.8k 1/4W	2.2M 1/4W	20R	0.33R 1/2W	115k 1/4W	15k 1/10W	1.5n 1.6KV	11n 1.6KV	22n 1KV	560n 250V	680n 250V	220u 400V	910R 1/8W	910R 1/8W	1R 1.5W	7VA.304
	9.234	6 mH	30 uH	1.0 mH	2x15 mH	1.5R 1/4W	2.7R 1/4W	1.5R 2W	0.47R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.33R 1/2W	115k 1/4W	22k 1/10W	1.5n 1.6KV	12n 1.6KV	15n 1KV	560n 250V	1u 250V	150u 400V	820R 1/8W	820R 1/8W	1.5R 1.5W	7RZ.304

	R115	R119	R192	R193	R502	R508	R516	C507	JP119	JP121	JP501	JP503	JP514	ST601	C601	C602
	-	-	12k 1/8W	12k 1/10W	-	-	-	-						T2,5AH 250V	220nF/275V	220nF/275V
	33k 1/10W	100R 1/8W	-	-	1k 1/4W	100k 1/4W	4.7R 1/4W	2.2u 63V							-	-

	JP107	JP115	JP128	JP130	JP141	JP142	JP402
NON-L/L'							
L/L'							

	+35V	D608	R608	JP622
33" & 29"	+45V & +35V	UF4006	1k 1W	
Others	+35V	-	-	

	C158	C159	C160	C165	C166	C167	C174	C175	C404	R111	R125	R130	R156	R161	R166	R173	R174	R175	R176	R179	R190	R196	R340	R415	R424	R429	D102	D501	Q101	Q102	Q103	X103	TU101	CABLE.3	CABLE.5
	1.5n 50V	2.2n 50V	47p 50V	-	-	-	-	-	-	100k 1/10W	1n 50V	470R 1/10W	220R 1/8W	1k 1/10W	10k 1/10W	-	-	0R	0R	-	0R	-	-	-	-	-	-	1N4148	4.43MHz	3.58MHz	-	-	7RZ.110-NL		
	-	-	-	2.2u 63V	100n 25V	100n 25V	220n 16V	220n 16V	47p 50V	-	0R	-	-	-	-	0R	0R	-	12k 1/10W	47R 1/8W	-	0R	0R	330R 1/4W	4.7k 1/10W	100R 1/8W	1N4148	-	-	-	12MHz	L/L' MODULE	7RZ.136-PH3		

	R148	R152	C152	C157
Front SVHS	-	-	470n 16V	47n 50V
Non-Front SVHS	0R	0R	0R	0R

	R302, R303, R316, R320, R323, R325, X301, JP310
Headphone Only Components	C317, C318, C352, C353, C358, C359, T303, T306, T308, T309

	F101	F107	IC101
DOLBY PROLOGIC	G3963M	G9353M	TDA8874
BG/DK	K3953M	K9353M	TDA8874
I	K3953M	L/L' MODULE	TDA8874
L/L'			

	R135	R136	R137	R167	R168	R169
110° & TDA884X	680R 1/10W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W
90° & TDA884X	680R 1/10W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W
110° & TDA887X	680R 1/10W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W	680R 1/8W
90° & TDA887X	470R 1/10W	470R 1/8W	470R 1/8W	470R 1/8W	470R 1/8W	470R 1/8W

Components designated by the safety symbol should only be replaced by original parts produced and proofed by the manufacturer.
Sicherheitsbauteile im Sinn der sicherheitsbestimmung. Diese Teile durfen nur durch Originalteile ersetzt werden.
Contrassegno di sicurezza. I componenti devono, corrispondere a ricambi originali e devono essere montati a regola d'arte.

Subject to change without notice

SECAM L/L' MODULE

SC.OUT_MONO
EHT_COMP
VDRIVEA
VDRIVEB
EW_DRIVE
CVBS_IN_SCART1
AUDIO_SCART_IN_MONO
(Intercarrier)
(QSS)

VDRIVE_A
VDRIVE_B
SIF_AGC
VSAWTOOTH
EW_AVL
VIDEO_OUT
EXT_CVBS
PHI_1
DIGIDEC
CVBS_IN
GND1
CVBS_OUT
GND2
PHI_2
Y_IN
EXT_SOUND
V_IN
COL_PLL_FILTER
U_IN
XTAL_443
V_OUT
XTAL_358
Y_OUT
BANDGAP
SEC_PLL
PLL_IF

CVBS_OUT_SCART1
CVBS_OUT_SCART2
CVBS_TXT

X101 RGB

CVBS_OUT_SCART2
CROMA_SC2
SCART
SK202

IC301	
A2 ONLY	MSP3400D
A2+NICAM	MSP3410D
A2, VIRTUAL DOLBY	MSP3401G
A2+NICAM, VIRTUAL DOLBY	MSP3411G
DOLBY PROLOGIC	MSP34X2G

SC2_IN_R
SC2_IN_L
SC4_IN_R
SC4_IN_L
AUD_CL_OUT
NC1
NC2
ADR_SEL
NC3
I2S_CL
I2S_WS
I2S_DA_OUT
I2S_DA_IN1
ADR_DA
ADR_WS
ADR_CL
DVSS

VDRIVEA
VDRIVEB
V_GUARD
V_SYNC
VI+
VI-
GUARD
GND
VP
VFB
OUTA
OUTB
FEEDBACK
IC501
+15V(F)
+35V
VERTICAL YOKE

SERVICE PLUG
IC402 S24C08
IC401 SAA5563
SCL
SDA
F_BLANK_OSD
R_OSD
G_OSD
B_OSD
COR_OSD
V_SYNC
H_SYNC
STATUS_1
STATUS_2
MUTE
P0.7
P0.0
SCL0
SDA0
SCL1
SDA1
FBLANK
R
G
B
COR
VSYNC
HSYNC
IREF
SYNC_FILTER
VPE
VSC
VSA
VSSD
P3.1
P1.1_T0
P1.3
P2.0_TPWM
P2.1
P3.0_ADC0
P3.2_ADC2
P3.3_ADC3
P3.4_PWM7
VDDM
VDC
VDDA
CVBS0
CVBS1
P0.1
P0.3
P0.2
P0.4
RESET
P06
P10
P05
P2.5_PWM4
P2.6_PWM5
P2.7_PWM6
XTALOUT
XTALIN
XTALGND
P1.2_INT0
P2.2
P2.3
P2.4
FRAME
CVBS_TXT
SVHS_SOURCE
L_L'
MSP_RESET
STAND_BY
IR_PIN
KEYBOARD
29" ONLY
29" FLAT ONLY
KA75270 IC403
MM

H_FLYBACK
H_SYNC
H_DRIVE
H-DRIVE
EW_DRIVE
TR501
BU508DF T504
HORIZONTAL YOKE
X502

EHT
FOCUS
SCREEN
TR502
CRT
X503
+35V
+15V(F)
+15V(8)
LINE FILTER MODUL - 110 Degree only
AC INPUT
MAINS
ST601 2.5A
L601
C601 220n/275V
C602 220n/275V
EHT_COMP
BEAM_CURRENT
ONLINE
TV_INT
OPTION-WEB
X660

KEYBOARD MODULE
KEYBOARD
PHOTO_SENSOR
IC901
LED1
VOL+
VOL-
PR+
PR-
STANDBY
X901

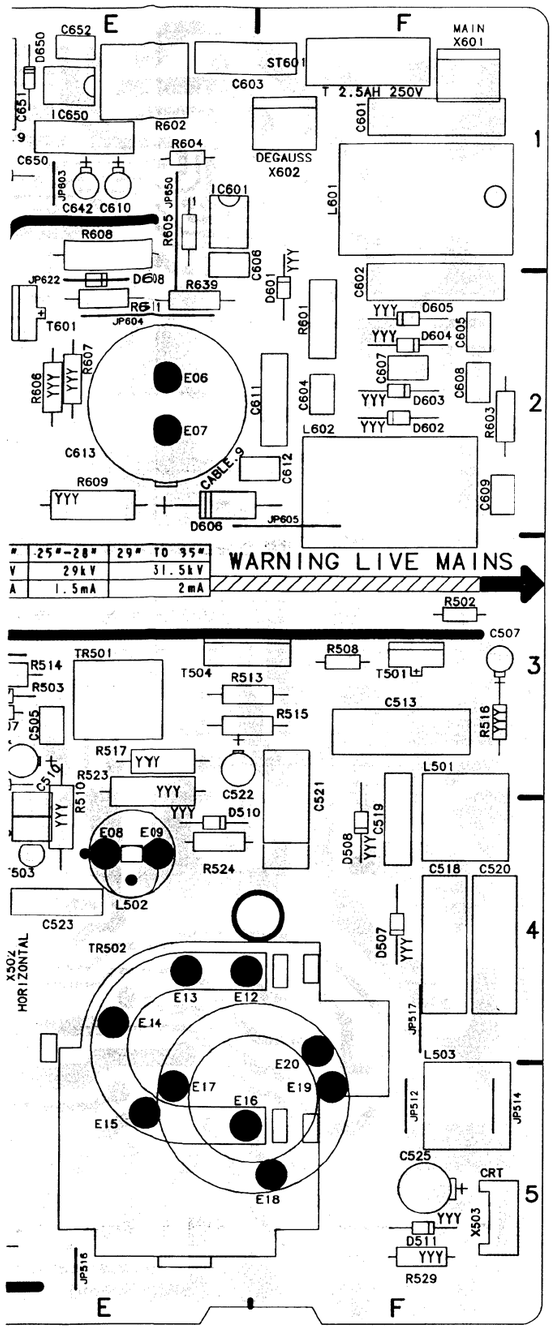
6-WAY PLUG
X920
VIDEO
X921
CINCH R
X922
CINCH L
X923
X924 SVHS_SOKET
SVHS MODULE

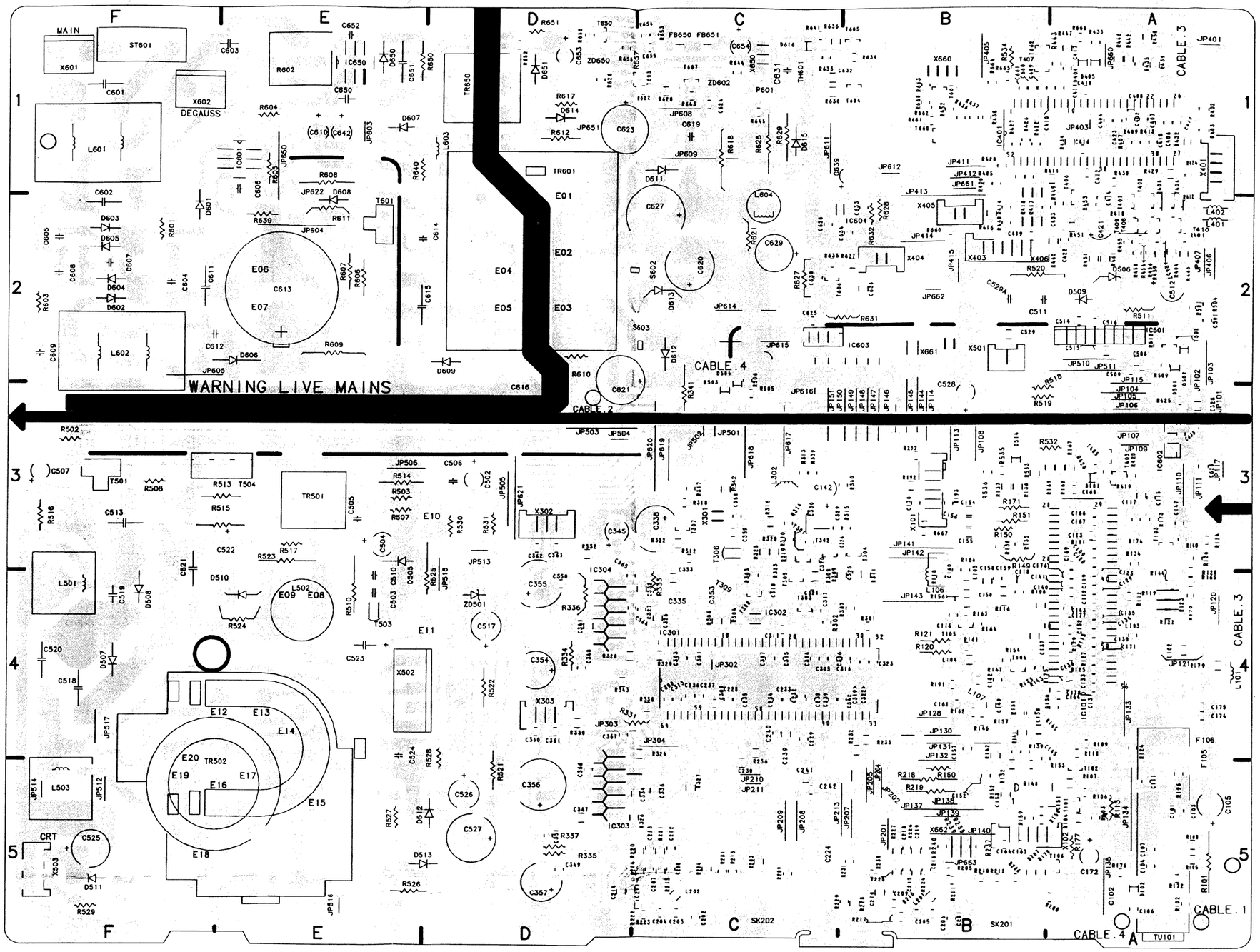
CRT MODULE
B_out
G_out
R_out
VDD
Black
GND
R_in
G_in
B_in
IC701
HS701
X701 RGB
Black
GND
Red
Green
Blue

	+145V	+28V	TR502	TR601	L501	L502	L503	L601	R518	R519	R525	R529	R530	R532	R602	R607	R625	R645	C513	C518	C519	C520	C5
20" 4:3 SAMSUNG A68ECR141X51	+119V	+25V	057.034	059.034	* -	70 uH	-	2x18 mH	2.7R 1/4W	3.3R 1/6W	10R 7W	0.47R 1W	10k 1/4W	-	27R	1R 0.75W	115k 1/4W	5.6k 1/10W	9.1n 1.6KV	-	-	-	390
21" 4:3 SAMSUNG A51EER131X41	+116V	+25V	057.034	059.034	-	70 uH	-	2x18 mH	-	1.2R 1/4W	10R 7W	0.1R 0.75W	10k 1/4W	-	27R	1R 0.75W	115k 1/4W	5.6k 1/10W	8.2n 1.6KV	-	-	-	390
25" 4:3 PANASONIC A59ECF50X05	+145V	+28.5V	057.534	059.534	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	0R	1n 2KV	10n 1.6KV	22n 1KV	560n 250V	470
28" 4:3 PANASONIC A66ECF50X05	+145V	+28.5V	057.534	059.534	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	0R	1n 2KV	10n 1.6KV	22n 1KV	560n 250V	470
28" 4:3 PHILIPS A66EAK071X11	+147V	+28.5V	057.534	059.534	6 mH	39 uH	1.5 mH	2x18 mH	1.5R 1/4W	1.5R 1/4W	1.5R 2W	2.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	0R	1n 2KV	11n 1.6KV	22n 1KV	560n 250V	470
28" 16:9 PANASONIC W66EHK51X36	+140V	+28.5V	058.034	059.034	6 mH	45 uH	1.0 mH	2x18 mH	1.2R 1/4W	2.7R 1/4W	1.5R 2W	1.2R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.47R 1/2W	115k 1/4W	33k 1/10W	1n 2KV	12n 1.6KV	18n 1KV	560n 250V	680
28" 16:9 THOMSON W66EJU023X015	+140V	+28.5V	058.034	059.534	6 mH	45 uH	1.0 mH	2x18 mH	3.3R 1/4W	1.5R 1/4W	1.5R 2W	1.2R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.47R 1/2W	150k 1/4W	33k 1/10W	1n 2KV	13.1n 1.6KV	15n 1KV	560n 250V	820
29" 4:3 SAMSUNG A68QCP891X001	+125V	+28.5V	058.034	059.534	6 mH	30 uH	1.5 mH	2x18 mH	2.7R 1/4W	1.2R 1/4W	4.7R 7W	0.47R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.33R 1/2W	115k 1/4W	15k 1/10W	1n 2KV	13.1n 1.6KV	22n 1KV	560n 250V	820
29" 4:3 LG A68QCU259X51	+125V	+28.5V	058.034	059.534	6 mH	45 uH	1.5 mH	2x13 mH	2.7R 1/4W	1.5R 1/4W	1.5R 2W	1R 1W	9.1k 1/4W	2.2M 1/4W	27R	0.33R 1/2W	115k 1/4W	10k 1/10W	1.5n 1.6KV	13.1n 1.6KV	22n 1KV	560n 250V	820
33" 4:3 V.COLOR A80EJA33X104	+159V	+30V	057.334	059.334	6 mH	30 uH	1.5 mH	2x13 mH	1.5R 1/4W	3.3R 1/6W	1.5R 2W	1.5R 1W	6.8k 1/4W	2.2M 1/4W	20R	0.33R 1/2W	150k 1/4W	15k 1/10W	1.5n 1.6KV	11n 1.6KV	22n 1KV	560n 250V	680
33" 4:3 LG A80QCF340X12	+159V	+30V	057.334	059.334	6 mH	30 uH	1.5 mH	2x13 mH	1.2R 1/4W	1.5R 1/4W	1.5R 2W	1.8R 1W	6.8k 1/4W	2.2M 1/4W	20R	0.33R 1/2W	150k 1/4W	15k 1/10W	1.5n 1.6KV	11n 1.6KV	22n 1KV	560n 250V	680
32" 16:9 PANASONIC W66EHK51X36	+131V	+28.5V	058.034	059.234	6 mH	30 uH	1.8 mH	2x15 mH	1.5R 1/6W	2.7R 1/4W	1.5R 2W	0.47R 1W	8.2k 1/4W	2.2M 1/4W	18R	0.33R 1/2W	115k 1/4W	22k 1/10W	1.5n 1.6KV	12n 1.6KV	15n 1KV	560n 250V	1u

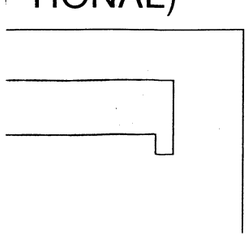
	IC501	IC701	T501	D507	D508	R114	R115	R119	R192	R193	R502	R508	R516	C507	JP119	JP121	JP501	JP503	JP514	ST601	C601	C602
90°	TDA8356	TDA6108	-	-	-	-	-	-	12k 1/8W	12k 1/10W	-	-	-	-						T2,5AH 250V	220nF/275V	220nF/275V
110°	TDA8351	TDA6107	2SK381	ERC06-1500	RGP30K	100k 1/10W	33k 1/10W	100R 1/8W	-	-	1k 1/4W	100k 1/4W	4.7R 1/4W	2.2u 63V							-	-

	IC401	L102	L105	L106	C102	C109	C113	C115	C117	C119	C121	C122	C124	C129	C131	C139	C142	C144	C158	C159	C160	C165	C166	C167	C174	C175	C404	R111	R125	R130	R156	R161	R166	R173	R174	R175	R17
NON-L/L'	452.483-01	1u	1u	10u	47u 16V	3.3n 50V	100n 25V	18p 50V	270p 50V	100n 25V	1u 100V	100n 100V	2.2u 63V	4.7n 50V	0R	-	-	-	0R	1.5n 50V	2.2n 50V	47p 50V	-	-	-	-	-	-	100k 1/10W	1n 50V	470R 1/10W	220R 1/8W	1k 1/10W	10k 1/10W	-	-	0R	0R
L/L'	452.782	1u	-	-	150u 16V	-	-	33p 50V	33p 50V	-		-	-	2.2n 50V	-	2.2u 63V	1u 25V	-	-	-	-	-	2.2u 63V	100n 25V	100n 25V	220n 16V	220n 16V	47p 50V	-	0R	-	-	-	0R	-	0R	12k 1

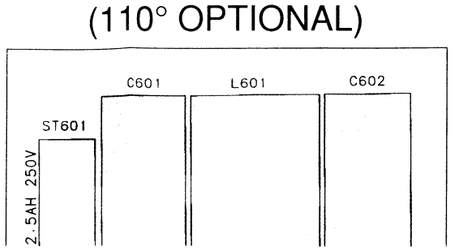




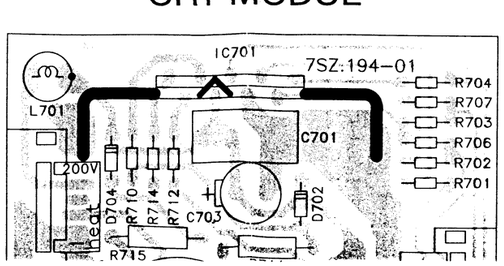
TCHING MODUL
PTIONAL)



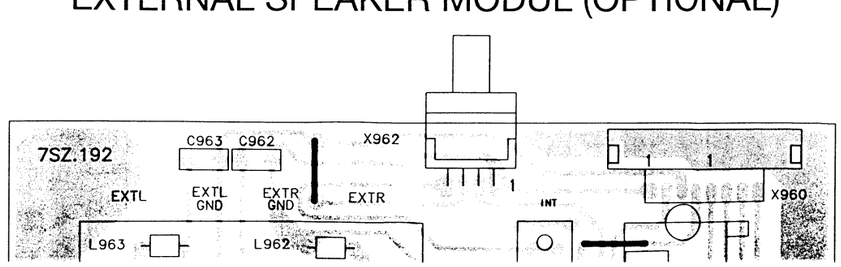
LINE FILTER MODUL
(110° OPTIONAL



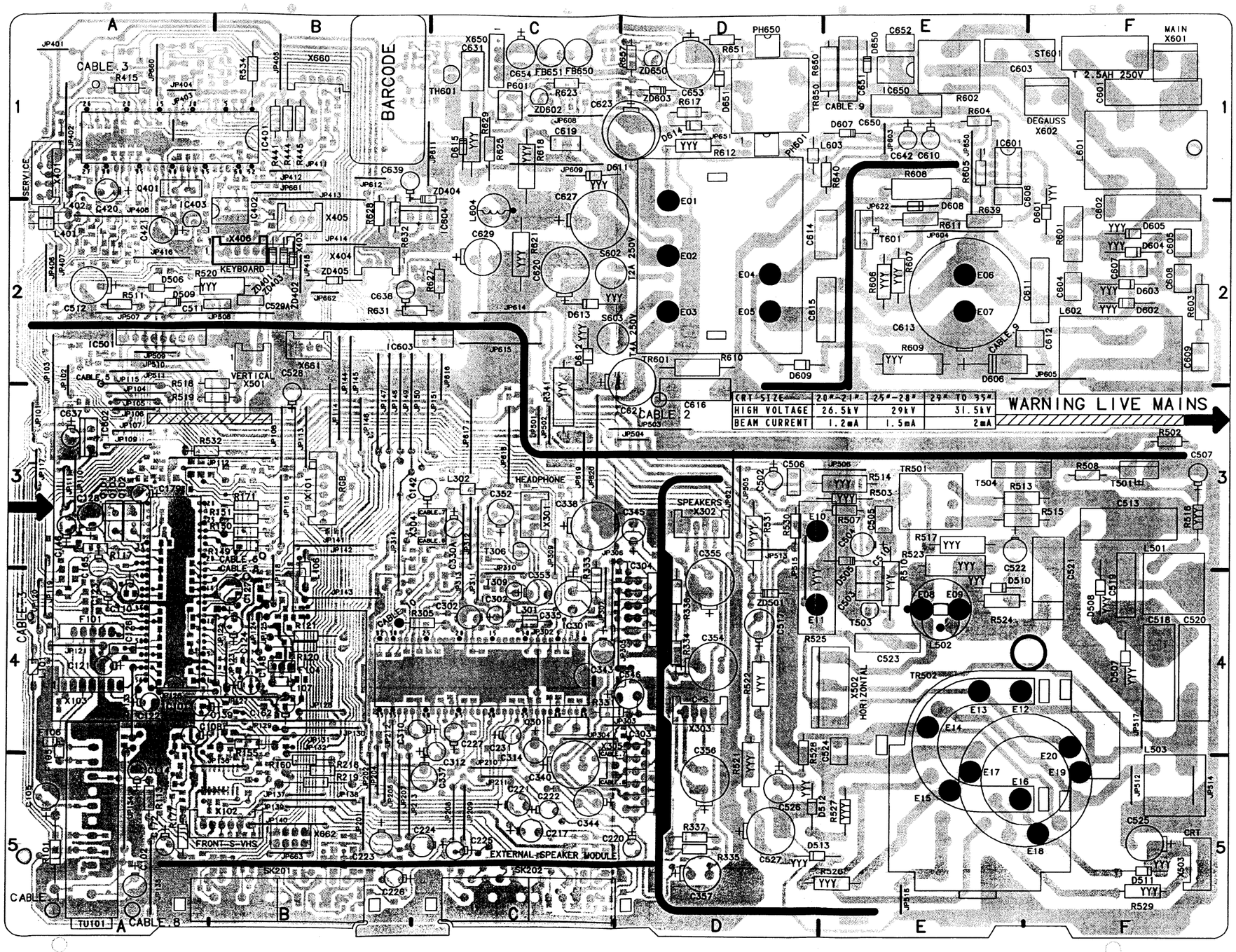
CRT MODUL

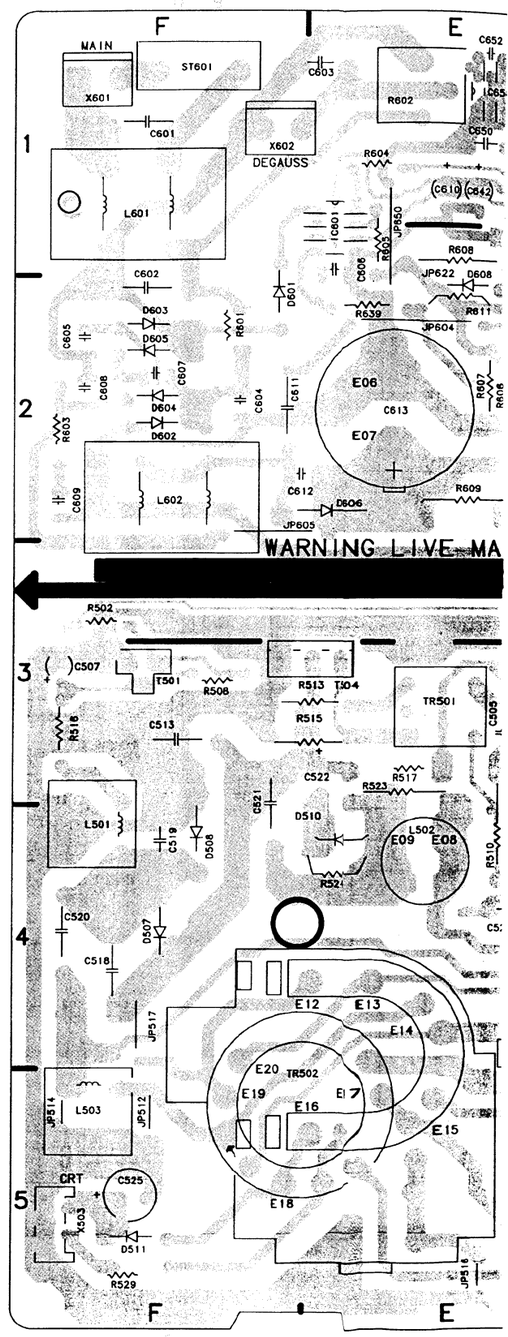


EXTERNAL SPEAKER MODUL (OPTIONAL)

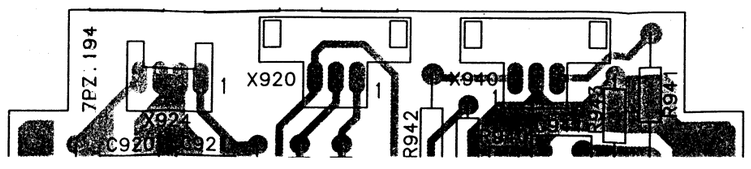


CHASSIS

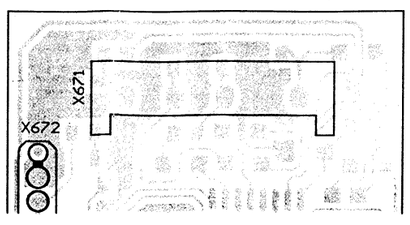




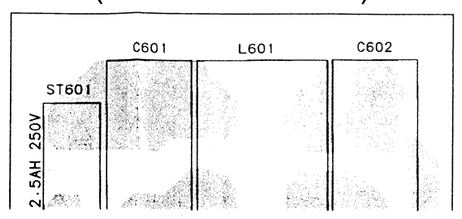
S-VIDEO/AV INPUT MODUL (OPTIONAL)



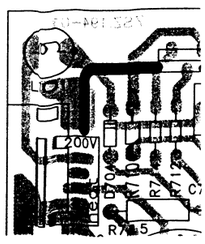
RGB SWITCHING MODUL (OPTIONAL)

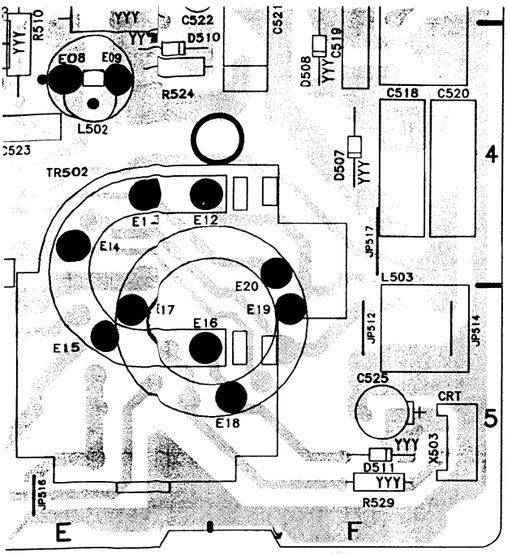


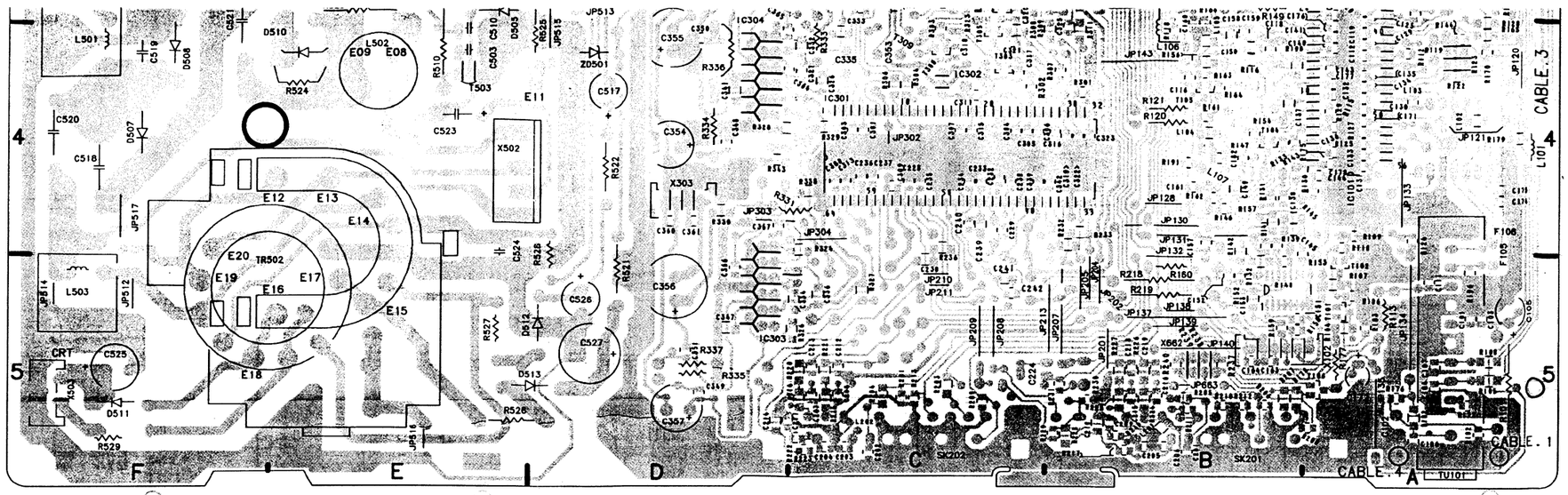
LINE FILTER MODUL (110° OPTIONAL)



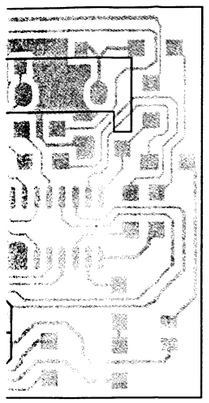
CR



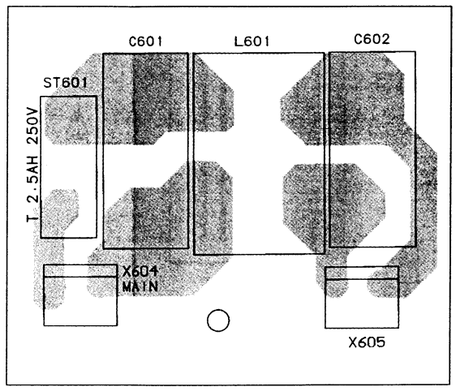




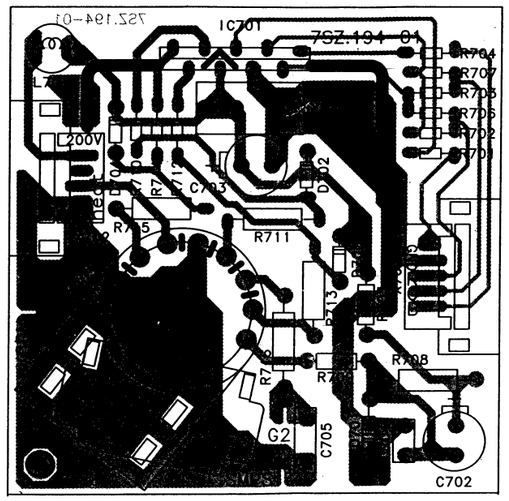
CHING MODUL
IONAL)



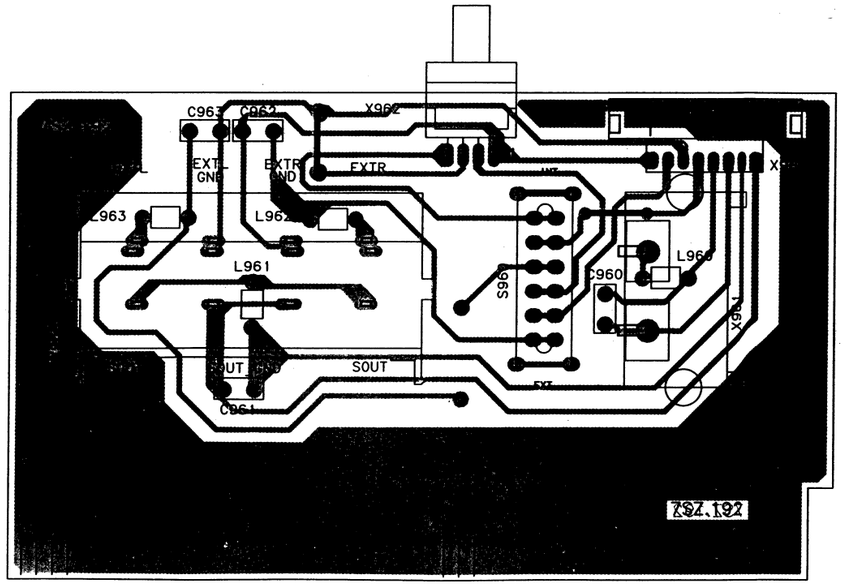
LINE FILTER MODUL
(110° OPTIONAL)

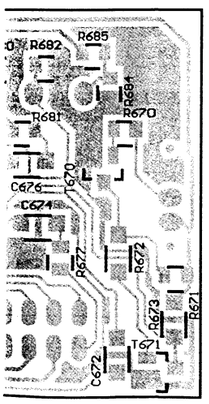


CRT MODUL

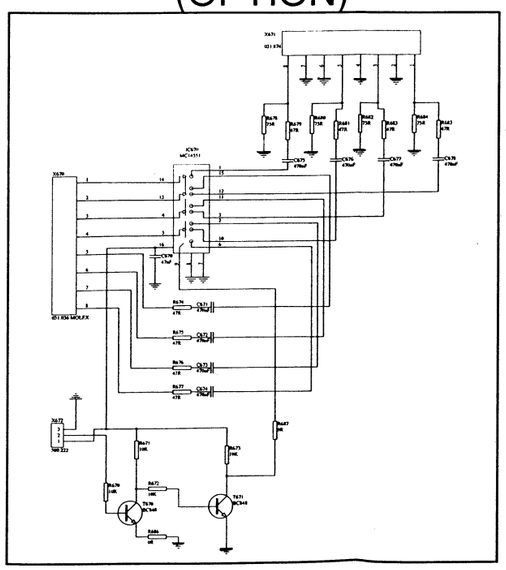


EXTERNAL SPEAKER MODUL (OPTIONAL)

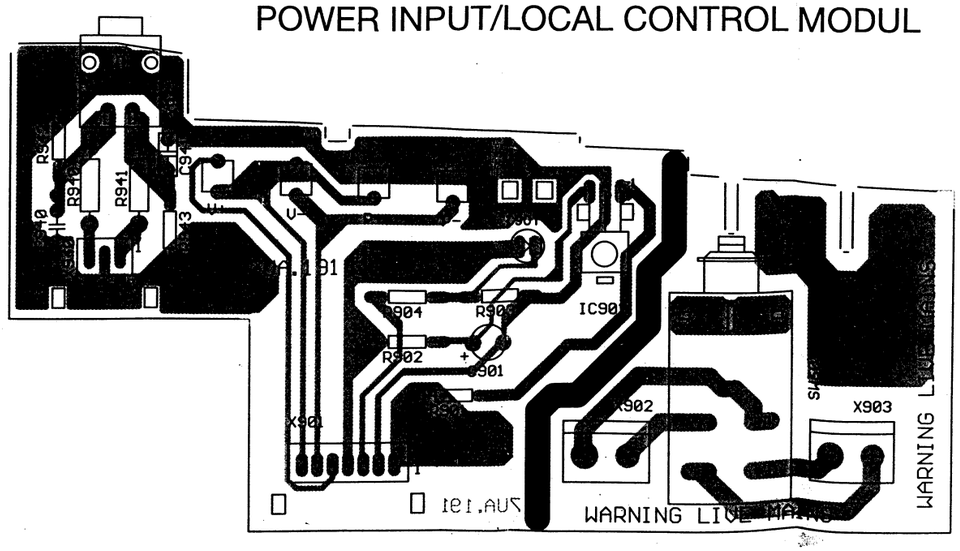




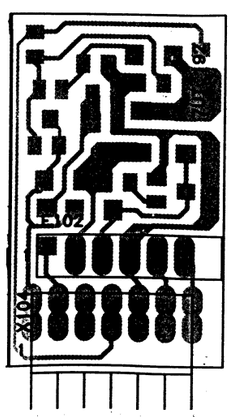
RGB SWITCHING MODUL
(OPTION)

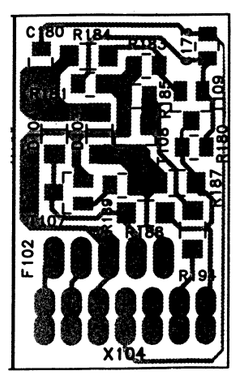


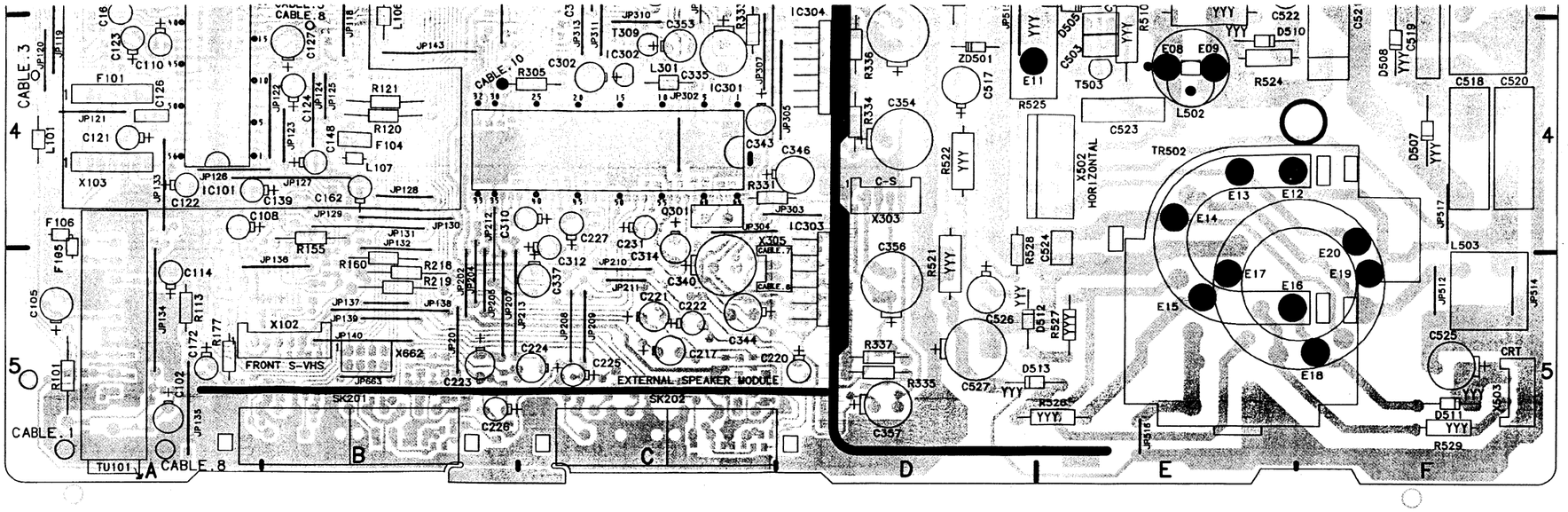
POWER INPUT/LOCAL CONTROL MODUL

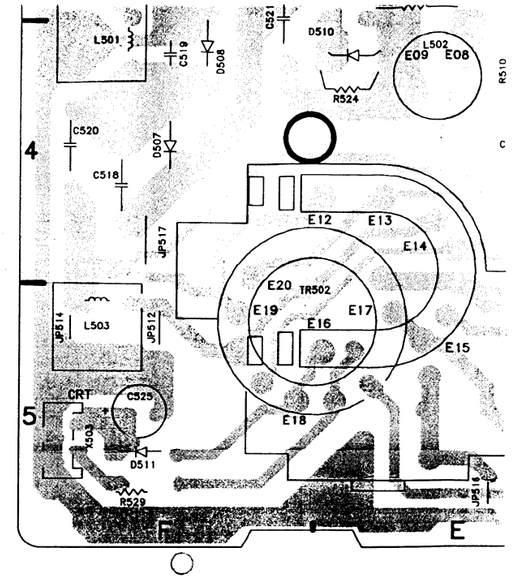


SEC LL' MODUL (OPTIONAL)

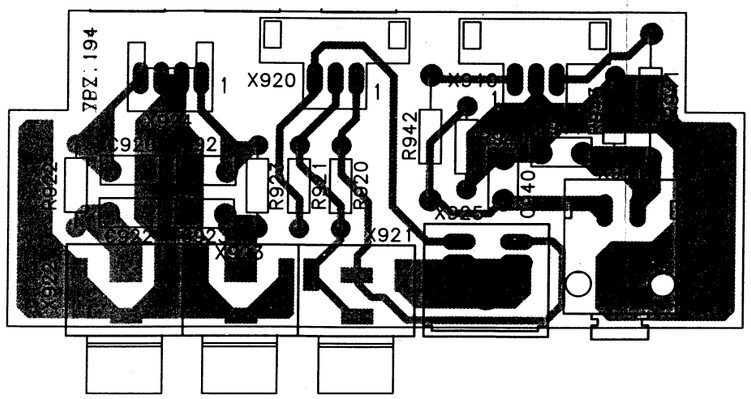


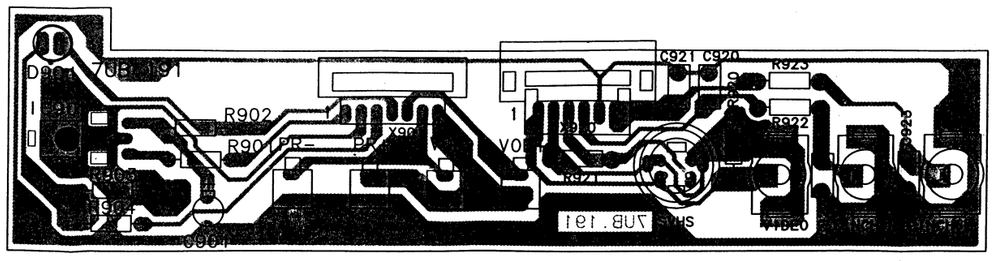


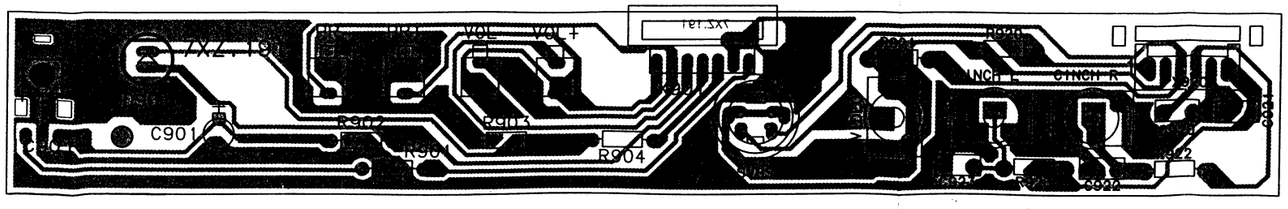




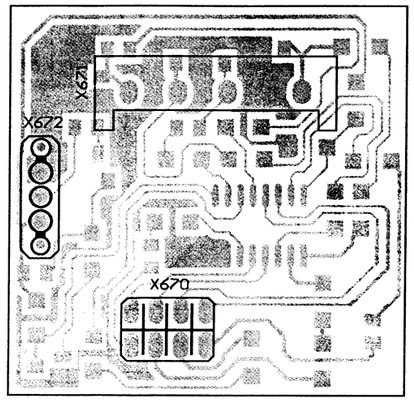
S-VIDEO/AV INPUT MODUL (OPTIONAL)

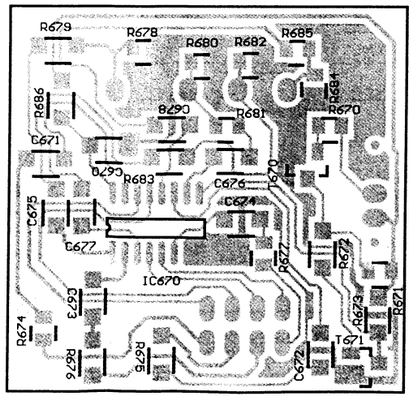




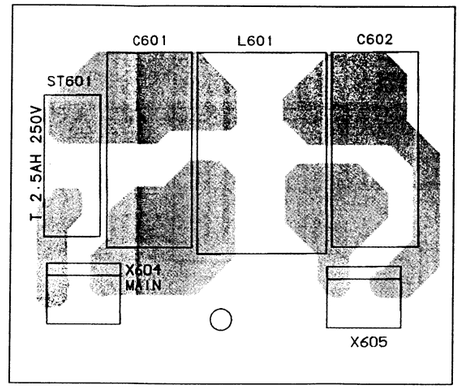


RGB SWITCHING MODUL (OPTIONAL)

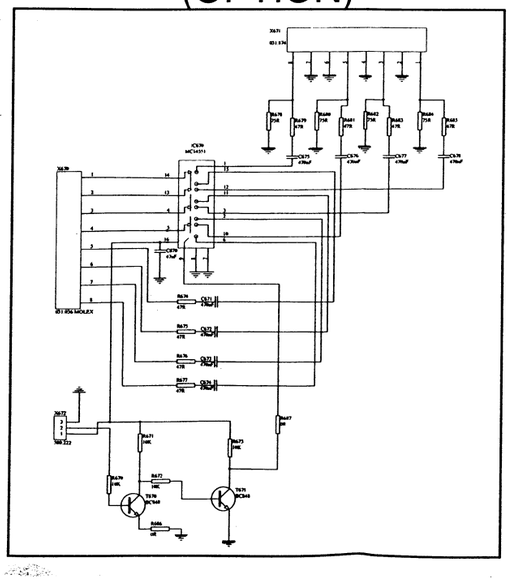




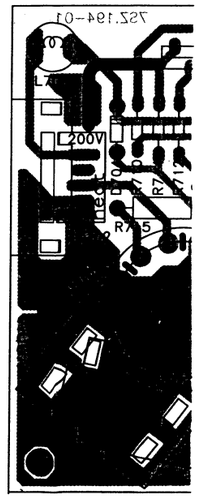
LINE FILTER MODUL (110° OPTIONAL)



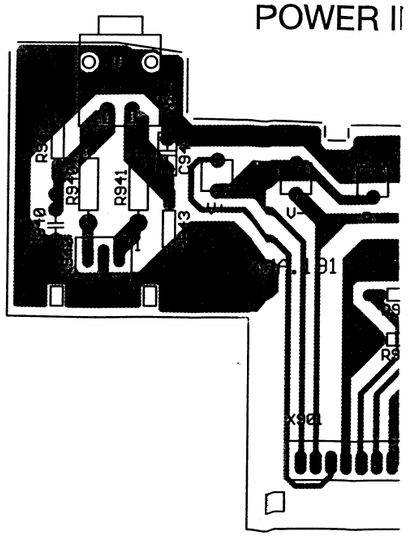
RGB SWITCHING MODUL (OPTION)



CR



POWER I



NOTE: S-VIDEO/AV INPUT, POWER INPUT/LOCAL CONTROL MODELS DIFFER FROM CABINETS.